

Everyman's Encyclopaedia

IN TWELVE VOLUMES

VOLUME NINE

Maps
to
Nyasa

THE THIRD EDITION

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EVERYMAN'S ENCYCLOPÆDIA
IN TWELVE VOLUMES

VOLUME NINE
MAPS—NYASA

EDITED BY ATHELSTAN RIDGWAY, LL.B.



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ABBREVIATIONS

The titles of subjects, which are printed first in bold type, have been abbreviated within each article to the initial letter or letters.

ac., acre(s).	is., island(s).
agric., agricultural.	It., Italian.
ambas., ambassador(s).	Jap., Japanese.
Amer., American.	jour., journal.
ancet., ancient.	Lat., Latin.
ann., annual.	lat., latitude.
arron., arrondissement.	lb., pound(s).
A.-S., Anglo-Saxon.	l. b., left bank.
A.V., Authorised Version.	long., longitude.
b., born.	m., mile(s).
Biog. Dic. , Biographical Dictionary.	manuf., manufacture.
bor., borough.	min., minute(s).
bp., birthplace.	mrkt. tn., market town.
Brit., British.	MS., manuscript.
C., Centigrade.	mt., mount; mountain.
c., about.	N., north; northern.
cap., capital.	N.T., New Testament.
cf., compare.	O.E., Old English.
co., county	O.F., Old French.
com., commune.	O.T., Old Testament.
cub. ft., cubic feet.	oz., ounce(s).
d., died.	par., parish.
Dan., Danish.	parl., parliamentary.
dept., department.	pop., population.
dist., district.	prin., principal.
div., division.	prof., professor.
E., east; eastern.	prov., province; provincial.
eccles., ecclesiastical.	pub., published; publication.
ed., edition; edited.	q.v., which see.
e.g., for example.	R., riv., river.
Ency. Brit. , Encyclopaedia Britannica.	r. b., right bank.
Eng., English.	Rom., Roman.
estab., established; establish-	R.V., Revised Version.
ment.	S., south; southern.
F., Fahrenheit.	sec., second(s).
f., flourished.	sev., several.
fort. tn., fortified town.	Sp., Spanish.
Fr., French.	sp. gr., specific gravity.
ft., feet.	sq. m., square mile(s).
Ger., German.	temp., temperature.
Gk., Greek.	ter., territory.
gov., government.	tn., town.
Heb., Hebrew.	trans., translated; translation.
hist., history.	trib., tributary.
horticult., horticultural.	univ., university.
h.p., horse-power.	urb., urban.
hr., hour.	vil., village.
i.e., that is.	vol., volume.
in., inch(es).	W., west; western.
inhab., inhabitant(s).	Wm., William.
	yd., yard.

The article ABBREVIATIONS contains a list of those in general use.
See also ABBREVIATION (music) and ELEMENTS (chemical symbols).

M

Maps are representations on a plane, and on a reduced scale, of part or the whole of the earth's surface. They are either topographical, cadastral, general, or atlas. Topographical M. are based on accurate survey, and show the natural features of the country, hills and rivs., forests and swamps; also such artificial features as tns. and vlls., buildings, roads, railways, canals, bridges, and telegraphs. They serve as guides for travel on business or pleasure, or for the operations of war. The 'one-inch' map (scale 1 in. to 1 m.) is the standard topographical map of the Brit. Isles. Cadastral M. are on a larger scale, as required for local administration, taxation, management of estates, legal documents, etc. These M. in other countries are often in MS. and deposited with the local authority. The Brit. map of the scale (q.r.) of 25 in. to 1 m., commonly called the 25-in. plan, shows hedges and fences, etc., but is not strictly a cadastral map, though commonly called so, because the real boundary of properties may frequently be some feet beyond the hedge. Moreover a cadastral map proper records the co-ordinates of boundary stones, corners, etc., referred to in the general framework of the survey. This registration of co-ordinates is more important in a country like Egypt, which has no permanent hedges or boundary walls and where the ann. inundation of the Nile may obliterate the very vague boundaries of cultivated lands. General or atlas M. are on a small scale, in which the topographical details are necessarily suppressed, for these M. aim at the representation of a large tract of country, a continent, or even the world. (An international world map, to a uniform scale of 1/1,000,000, is described later.)

M. of the sea-coast, and to some extent of the sea bottom, are generally known as charts (q.v.). They give information of buoys, lights, soundings, etc., all referred to low water as datum, instead of to mean sea level, with information on tides or currents. It is to be noted that charts which were good enough in the old days of sail and low-powered steamships are not now satisfactory for the requirements of the fast, deep-draught vessels of to-day. The hydrographic dept. of the Brit. Admiralty, since the Second World War, is engaged in the great task of recharting the oceans of the world. Particular attention is given to the location of wrecks, which is effected by means of an echo-sounder, which records electric impulses 'bounced' off the sea bed. In shallow coastal waters dual cameras on aircraft, using panchromatic film, will locate wrecks to within 3 ft. of their depth. (See H.M.S.O., *Charting the Seas in Peace and War*, 1949.)

The oldest extant M.s. are said to be the

Babylonian clay tablets in the Brit. Museum (c. 2300 B.C.). The anc. Egyptians were skilled mathematicians, and were producing scientifically constructed cadastral M.s. as early as Rameses II. (1330-1300 B.C.). From such M. Eratosthenes (276-196 B.C.) measured the distance from Syene to Alexandria, from which he estimated the size of the earth. The accuracy of the M. is shown by the fact that the estimate of Eratosthenes was not improved upon till the determinations of Picard in 1671. The *Mappa Mundi* at Hereford Cathedral was made about 1290.

PROJECTIONS.—A spherical surface, unlike a cylindrical, cannot be unrolled into a plane surface. Hence it follows that it is impossible to give an absolutely true representation of the earth on a plane map, but only on a globe. To represent it at all the sphere must be projected on to the plane. It is usual to define position by reference to lat. and long. lines, and any representation of these lines upon a plane is called a 'map projection.' Though projections in actual use are not strictly projections in the geometrical sense, they approximate to them. The perfect map would show uniform and correct shape, and correct angles (bearings). In settling the particular kind of projection to be adopted in showing parts of the earth's surface on a plane map surface, consideration must be given to the area of the survey, the purpose for which it is required, and the degree of accuracy desired. Some of the qualities desirable in a theoretically correct map must therefore be sacrificed, and the main purpose of the map will be the deciding factor. The system of meridians and parallels forming, as it were, the general framework construction of any map is known as the graticule, and every 'hole' in it is known as a mesh. It is only possible here to give a brief account of the more important projections.

Rectangular Projection.—In this the meridians are all straight vertical parallel lines and the parallels of lat. are horizontal parallel lines perpendicular to the meridians. The map is started by drawing a central meridian and marking off degrees of lat. thereon, as given in geodetic tables, through which parallels of lat. are drawn as straight lines at right angles to the central meridian. Degrees of long. are marked off in a similar way on the middle parallel and meridians drawn through these points parallel to the central meridian. This method should not be used for sheets containing a larger area than 100 sq. m. The detailed plotting of topographical details may be done by polar or rectangular co-ordinates.

Trapezoidal Projection.—This may be used for M. containing an area of not more

than 25 m. square, i.e. 625 sq. m., in which the meridians and parallels are all straight lines, but the meridians are drawn to converge. It is started by drawing a central vertical meridian and dividing it for lats. all as before. Two parallels of lat. are then plotted, one about quarter the height of the sheet up from the bottom and the other about quarter the height down from the top. These are then divided into degrees and minutes at their respective lats., as given in geodetic tables. The meridians are then drawn as straight converging lines through the points of div. on these two parallels. The longs. indicated on the map will be correct, and the lats. nearly so.

Cylindrical.—Let us imagine a plane surface wrapped round the globe in the form of a cylinder of the same height, touching the equator. Further let us suppose the plane of each meridian and parallel produced to touch the cylinder, so that, on unfolding, the former would be represented by vertical straight lines, and the latter by horizontal. Such a projection would be much distorted in the region of the poles, though approximately true in equatorial regions. Its merit is that, in spite of distortion in shape, equal areas on the globe are represented by equal areas on the map. Hence it is called an equal-area cylindrical projection. Another cylindrical projection, almost universally used for navigation, is Mercator's. Its approximate form can be visualised by supposing a light at the centre of the globe to cast a shadow of the meridians and parallels on a cylinder of infinite length enclosing it. Here, as the polar shadows are at infinity, there is obviously tremendous distortion in size at extreme lats., but within 30° N. or S. lat. of the equator the representation is good. This projection retains the characteristic property of orthomorphic or stereographic projection, viz. similarity of representation of small parts of the surface (see next paragraph). Its importance is due to the fact that the loxodromic curve, i.e. a line on the sphere cutting all the meridians at the same angle, becomes a straight line on the map. In effect this means that bearings read from the map are true bearings.

Stereographic.—Here the point of vision is supposed to be on the sphere's surface, and the plane of projection is the tangent plane at the other end of the diameter through the point of vision. In this projection the scale varies, but is orthomorphic, i.e. a small area of any particular shape on the globe is represented on the map by an area of the same shape.

Central or Gnomonic Projection.—Here the point of vision is supposed to be at the centre of the sphere, and all great circles are accordingly represented by straight lines. The plane of projection may be either parallel to the plane of the equator, or parallel to the plane of some meridian, or inclined to the axis of the sphere at any angle. These three variations are known as polar, meridional, or horizontal.

Conical.—Many modifications of the conical projections are in use. They are

(1) the simple conic with one selected parallel; (2) De L'Isle's projection with two standard parallels and with rectified meridians; and (3) Bonne's projection, in which all the parallels are properly divided. This was largely used by the Fr. but abandoned in 1917. It was used for the 1-in. Ordnance Survey (O.S.) map of Scotland. The most important is that with two standard parallels. A mental picture approximating to it can be formed by supposing the plane of the map to be folded into a cone cutting the sphere's surface at any two selected parallels. When the map is unfolded again these two parallels will be represented by concentric arcs of correct length; other parallels will be concentric arcs not quite true to length; and the meridians will be radii, also untrue to length. Provided the portion of the sphere represented on the map is not too great, no very significant distortion of any kind is produced.

Sinusoidal Equal-area Projection.—This is a particular case of Bonne's projection, the selected parallel being the equator. It is a projection very suitable for the map of Africa.

Polyconic Projection.—In the foregoing simple conic projections only one tangent or intersecting cone is used, but for very large areas it is better to make each parallel of lat. the development of the base of a cone tangent to the sphere at that lat. This polyconic projection is employed for the M. of the U.S. Coast and Geodetic Survey.

Some Special Purpose Projections.—
 (1) Globular; (2) Elliptical (equal area); (3) Zenithal, in which some point on the earth is selected for a central point of the map, great circles radiating from this point being represented by straight lines; (4) the Two-point Equidistant; having chosen two points on the sphere, the distances on the map from these two points to all other points are true to scale; (5) a map, based on a modified oblique Mercator projection, was prepared by A. R. Hinks, C.B.E., F.R.S., in connection with the preparatory International Conference on Trade and Employment, in London in Feb. 1946 (pub. in *World Affairs*, June 1947).

A comprehensive disquisition on sphere and map projections, with finely drawn steel engravings, will be found in P. Nicholson's *Popular Course of Pure and Mixed Mathematics* (1825).

THE GREAT INTERNATIONAL MAP OF THE WORLD.—This was first proposed by Prof. Penck at the International Geographical Congress at Berne in 1891. It is to the scale of one-millionth ($1/1,000,000$ or $1/M$), and a kilometre of distance is therefore represented on the map by 1 millimetre. It is officially known as the *Carte du monde au millionième*. Since this original proposal a series of conferences has been held at various times from 1891 to 1928 at London, Geneva, Rome, Paris, and London, and a comprehensive convention on points of detail was gradually and unanimously built up. Greenwich was adopted for the prime meridian, a colour scheme (*gumme*) for the

representation of altitudes was agreed, and, after much discussion a metric system for units, contours, and for the 'grid' was accepted. A central office for the world map was estab. at the headquarters of the Brit. Ordnance Survey Dept. at Southampton (since removed to Chessington, Surrey—*see below*), and a branch office at the headquarters of the Royal Geographical Society; but no definite arrangements were made for a centralised publishing and selling agency. The projection of this international world map is a slightly modified form of the simple polyconic projection proposed by one of the Fr. delegates, M. Lallemand. It has all the properties necessary for such a map—that neighbouring sheets shall fit along their edges; that the representation of distances and bearings within the sheet shall be sensibly perfect; and that it shall be constructed with ease. Each sheet comprises 4° of lat. by 6° of long., each being plotted independently. The upper and lower parallels have the radius $V \cot \text{lat.}$, where V in each case is the normal terminated by the minor axis. Instead of the central meridian (which is a straight line) being exactly to scale the meridians 2° to the E. and W. of it are true to scale, the object of this device being to reduce the maximum error. The meridians themselves are divided equally and the inner parallels join the appropriate points on the meridian. The normal vertical interval of contours is 100 metres. The international world map is generally referred to by the symbol 1/M—but the system of numbering and lettering the sheets is complicated. On this map Great Britain falls on no less than seven sheets. To avoid this inconvenience the Brit. Ordnance Survey decided to produce a special ed. in two sheets, each 26*½* in. by 26*½* in., and in this form one is better able to appreciate the real merit of the international map. The system of layer colouring brings out the relief with great clearness. Communications are very well delineated, prin. roads being shown by strong red lines and secondary roads by fine red lines. Railways are shown in black, double and single lines and narrow gauge and light railways being distinguished. The international co-operative effort involved in the preparation of the 1/M international world map was interrupted by the two world wars—and its progress from 1919 to 1942 has been disappointing. The thirty or forty publishing establs. concerned have not always been consistent in conforming strictly to the conventions agreed; but the map is beginning to be very useful as it becomes more complete and its merits better recognised, especially in relation to peace conferences, to UNESCO, and to the new European movement launched at Strasbourg in 1949. The former offices of the central bureau, with their contents, including the whole of the collection of the international 1/M. map series, were destroyed during the Second World War. The central bureau is now situated at the Ordnance Survey Office, Chessington, Surrey, England. The president requested

(1949) the receipt of a copy of every international 1/M map sheet pub. to date in order to reconstitute the map library of the central bureau, also a list of the sheets, so far unpublished, of the international 1/M series upon which work was in hand, or was to be put in hand, with the approximate date for their pub.

REPRESENTATION OF HILL FEATURES.—A difficulty in cartography is to show hill features on a flat surface. The earlier M. either did not attempt to do so, or represented them by 'mole-hills' drawn on the map. These showed approximate positions, but little else. The use of contours (*q.v.*) was introduced by M. S. Crucius in 1728. They may be considered as successive coastlines at equal vertical intervals, if the landscape were to sink into the sea. It is possible to obtain an accurate mental picture from a contour map, as well as to deduce mathematically exact information; but it may involve detailed study and requires previous education in map-reading. To render hill features visible at a glance and without special training 'hachures' were devised by L. C. Müller in 1788. They are lines crossing the contours at right angles, their thickness varying with the slope. The disadvantage in the older M. was that, in hilly country, the black hachures concealed other features and names. Hachures belonged to the days of delicate and expensive engraving upon copper and are rapidly becoming obsolete. Excellent examples of the system, however, are to be seen in the old engraved sheets of the 1-in. O.S. M. of the United Kingdom, and it survives on a few modern colour-printed M., as, for example, the new 1-in. O.S. map of England. J. G. Bartholomew (of the celebrated firm of cartographers, Messrs. John Bartholomew & Son) was responsible for the now universally recognised way of portraying the relief of the earth's surface: the introduction of hypometric (or contour) colouring.

LAYER MAPS.—Layer M., in which the spaces between different contours are tinted in different colours, were first constructed by Carl Ritter in 1806. Contour M. immediately became easy to visualise. Improvements in the mechanical processes of colour printing, and the use of transparent colours, have led to a great development of layer M. The system of using colours in the order of the spectrum, now almost universal, was introduced by E. G. Ravenstein in his map of Ben Nevis. In some of the finest examples of modern cartography the layer system is supplemented by hill shading in transparent colours, giving the effect of a relief map. The main drawback to such M. is the cost of printing. The specimen plate attached to the report of the International Map Conference of 1913 was printed at the Brit. War Office. It is a masterpiece of layer printing.

MAPS OF THE ORDNANCE SURVEY.—For the hist. and functions of this institution in Great Britain see the article **ORDNANCE SURVEY**. For convenience in production the M. pub. by the Ordnance Survey are classified as (1) small scale—up to 1 in. to

1 m.; (2) medium scale— $2\frac{1}{2}$ in. and 6 in. to 1 m.; and (3) large scale, about 25 in. and 50 in. to 1 m. Normally the line between 'maps' and 'plans' is drawn just below the 6-in., everything smaller in scale being known as a map. The 4-in. map has been for many years the standard map for motoring. The usefulness of these has been greatly increased by a rearrangement of the sheet lines, by showing the Ministry of Transport road numbers and classification, and adding the national grid (g.r.). Among 4-in. M. an entirely new series is in preparation, incorporating the national grid. Sheets will be larger than in the pre-war ed., and are of standard sizes, but the map of Greater London will be issued in a particularly large sheet. Separate administrative M. for each co. are pub. for England and Wales. One-in. M. are the original standard M. of the Ordnance Survey, and are valuable not only to the student of geography, but also are well suited for the needs of walkers, cyclists, and motorists, and those who wish to understand and appreciate the details of the countryside. Footpaths, roads, rvs., streams, woods, high- and low-water marks are all delineated, and altitudes above mean sea level are shown along main roads, etc., while contours are drawn at 50-ft. intervals, and the grid lines are 1 kilometre apart. Among the new features shown on the sixth (new popular) ed. are National Trust areas, youth hostels, wireless masts, and electricity transmission lines, and telephone call-boxes in open country.

The new O.S. map, to a scale of 1/25,000, or about 2 $\frac{1}{2}$ in. to 1 m., was produced as a result of the recommendations of the departmental committee set up in 1935, it having been considered that there was too wide a gap between the 1-in. and the 6-in. series. Some 500 sheets have been pub. (1949). The new map has been produced on National Grid sheet lines and is based on the old 6-in. map to which certain revision material, collected for A.R.P. wartime purposes, has been added. It is obtainable in three styles, the fully coloured, the outline, and the administrative areas, which latter, by means of a red overprint, defines all classes of boundaries down to parishes and wards. It should be studied in relation to the report of the Boundary Commission, pub. 1949, which recommended revision of the areas of some of the smaller authorities.

Special Ordnance Survey Maps.—In former days the main function of a map was to provide a guide for travellers, showing them where different places were, and how to get there by road, rail, or by ship. To-day these functions have been enormously extended, and M. are now produced (in the Brit. Isles at least) to provide special visual information on a variety of matters other than communications, e.g. historic, political and economic, and administrative, of special interest to

'planners' of all kinds. First may be mentioned two 'period' M.: (1) Roman Britain and (2) Britain in the Dark Ages (A.D. 410-871). These are on the 1/M scale, or 15·782 m. to 1 in., and with the map can be obtained an explanatory pamphlet giving a list of reliable books on the period, a chronological table of important events, and an index of names.

Among the remaining M., constituting this special 'Planning' Series, but to a scale of 1/625,000 or about 10 m. to the inch, on the transverse Mercator projection and carrying the new National Grid lines at 10-kilometre intervals, are the following, sponsored by many gov. depts. and by independent research organisations for planning purposes: base maps, administrative areas, land classification, land utilisation, types of farming, grasslands, pop. density, pop. of urban areas, geological, topographical, coalfields, iron-mines and quarries, iron and steel works, roads, railways (including underground), electrical statutory supply areas (both power companies and joint boards, etc.). M. in course of preparation include such subjects as gas supply, electricity supply lines, pop. changes and migrations, economic minerals, posts, and a new geological map of Scotland and the N. of England incorporating results of much research work. Other special M., to varying scales, include the Channel Is., the Scilly Isles, the Royal Botanic Gardens at Kew, and the 1 $\frac{1}{2}$ Million of Great Britain (on one sheet).

Relief Maps.—These are models produced by several methods from contoured M. In the peg method, heights above sea level are represented by pegs of appropriate length set up along the contours; a suitable medium is packed between them so as to create a smooth surface. In the layer method contours are drawn on separate cardboard sheets and cut out; these are placed above each other and clay or plasticine used to make an even surface. In the section method vertical, parallel sections are drawn on cardboard, profiles cut out, thickened with plasticine, and arranged in order. The surface is smoothed, streams marked in, etc. From originals made by these methods moulds may be constructed from which cement or plaster casts can be taken. Geological features, strata, etc., may be shown by colour. Some vertical exaggeration as compared with the horizontal scale is usually necessary. The project for a 6 in. to 1 m. relief map of England and Wales, proposed in 1949 by Sir Clive Morrison Bell, envisaged a model 1100 yds. long, showing all natural features, roads, etc., and divided by gangways for inspection.

AIR SURVEY MAPS.—Among the recommendations contained in the final report (dated Feb. 3, 1938) of the departmental committee on the Ordnance Survey (commonly known as the Davidson Committee) was one to the effect that

Maps

5

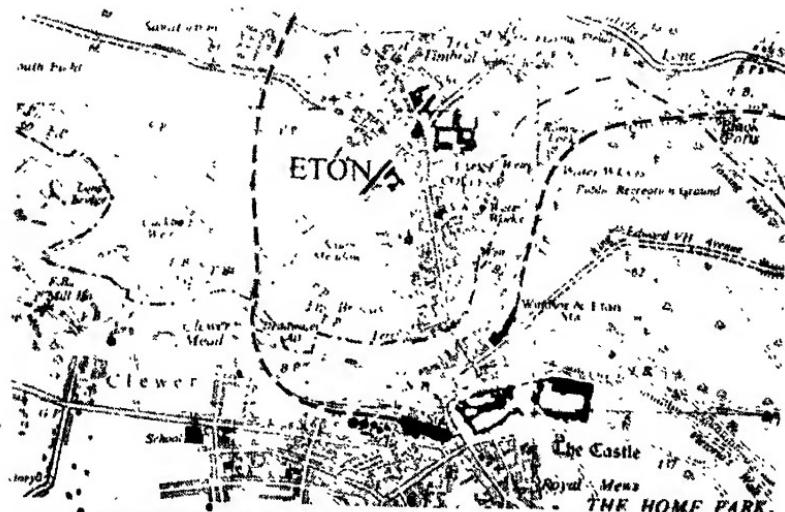
Maps



QUARTER INCH TO ONE MILE: SCALE 1/253,440



ONE INCH TO ONE MILE; SCALE 1:63,360



ABOUT TWO AND A HALF INCHES TO ONE MILE: SCALE 1/25,000

short-term contracts to civil firms, for aerial photographs, should not be continued as a permanent policy but that the gov. should consider the formation, as soon as possible, of a special air-survey unit capable of satisfying the requirements of the Ordnance Survey. This recommendation was accepted, and during 1947 and 1948 the R.A.F. air-surveyed 589,000 sq. m. of ter., of which 295,000 sq. m. were in E. Africa and 185,000 sq. m. were in the United Kingdom. Considerable work has been done in the aerial photography of central London streets and blitzed buildings, and in air-photo mosaics and obliques by commercial air photographers.

See also CHARTS; CONTOURS; NATIONAL GRID; ORDNANCE SURVEY; PHOTOGRAPHY; SCALE.

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Maquis, see under GUERRILLAS.

Mar, Earl of, see COCHRANE, ROBERT.

Mar, John, eleventh Earl of (1675-1752), famed as the leader of the 1715 rebellion. He continually changed sides politically, being in turn Whig and Tory as it was advantageous to him, this practice earning him the name of 'Bobbing John.' As a Whig he assisted in the union of Scotland and England. After the union and on the overthrow of the Whig Gov. he again became a Tory, and was made secretary of state for Scotland. Later, on the accession of George I., he again endeavoured to keep his position by changing sides, but falling on this occasion to obtain favour, he lost his office. This so angered and disgraced him that he returned to Scotland and started the rebellion at Braemar, and soon had a large and enthusiastic following. His fickle character, however, again showed itself in his hesitancy, and his long delay in the Highlands enabled the duke of Argyll to check him when he finally advanced at the battle of Stirling. He then gradually retreated and escaped with the Pretender to France. He was a favourite of the Pretender, and when arrested in Geneva he purchased freedom and the possession of his estates by betraying James.

Mar, name of an old Scottish dist. and forest in the S. of the co. of Aberdeen. It lies between the Rz Don and Dee, and is divided into Cromar, Braemar, and Midmar. W. of Braemar vil. at the head of the Dee valley stretches the forest of M., originally a royal hunting ground in the twelfth century. The demands of war have

denuded much of the area of its trees, but Glen Tilt and Glen Dee still afford scenery of great beauty and grandeur.

Marabou, large W. African stork. Its feathers are used chiefly for trimming feminine headgear.

Marabouts, class of religious saints or sorcerers among the Berbers of N. Africa, held in high esteem. They held Spain and Morocco for a considerable period. The Almohads put an end to their temporal dominion, but they continued to exercise spiritual superiority over the Muslim Negroes of Barbary.

Marabrun, Gascon poet and troubadour of the twelfth century. According to tradition he was a foundling discovered and brought up by Audric del Vilar, and was assassinated by an enemy. His famous poems are in praise of the crusades: *Aujatz de Chan* (1135) and *Pax in nomine Domini* (1137).

Maracaibo, fortified city of Venezuela. S. America, situated on a sandy plain on the W. shore of the strait which connects the lake of M. with the gulf of the same name. It is the chief tn. of a prov. of the same name in the state of Zulia. It is a handsome tn. with a hot but healthy climate. There is trade in sugar, coffee, coco, and rubber, and the oil industry centres here. The harbour is spoilt by a bar, which renders transhipment to smaller draught ships at Curacao necessary. A new pier and gov. buildings have been erected. M. has an air station and a regular service to Maracay. M. is notable historically as the scene of one of the most daring of the exploits of the famous buccaneer, Sir Henry Morgan (*q.v.*). In 1918 M. was a small primitive tn. of 15,000 inhab., mostly Indian and Negro; its aspect having altered but little since the sixteenth century; it was without pavements or sewers, or any of the conveniences of a modern city. Yet, through the foreign exploitation of oil in the M. region in the short space of ten years M. became the second city of Venezuela, a little metropolis with paved streets, modern public services, tall office buildings, golf clubs, and substantial dwellings. Pop. 112,500 (white foreigners 30,000).

Maracaibo, Lake and Gulf. The lake of M., in the N. of Venezuela, is about 100 m. in length and 70 m. in breadth. A bar at its mouth prohibits the entrance of large vessels. It is connected with the gulf of the same name by a strait 20 m. in length and from 5 to 10 m. in breadth. The gulf is a wide inlet of the Caribbean Sea, 150 m. from E. to W., and about 75 m. from N. to S. The longest single producing oil-field in all Lat. America is on the E. shore of Lake M., near the vil. of Lagunillas.

Maracay, chief tn. of the state of Aragua, Venezuela. Has cotton mills and a wireless station. Pop. 30,000.

Maragha, city of Azerbaijan, Persia. 50 m. S. of Tabriz, enclosed by walls. The tomb of Genghis Khan is here, and an observatory was founded on an adjacent mt. by his grandson, Hulagu Khan. M. is noted for its fine marble. Pop. 45,400.

Maragogipe, tn. of Brazil in Bahia state, at the head of All Saints' Bay, 25 m. S.W.

Maraka

of Cachoeira. A variety of coffee is named after it. Pop. about 15,000.

Maraka, see NEW DONGOLA.

Maramuresh, div. of Rumania, lying between the Hungarian border and Moldavia. Pop. (with Crisana) 1,460,000.

Maranhão, maritime state of N.E. Brazil, largely covered by forests, but the river valleys and coastal districts are very fertile, producing maize, cotton, sugar, rice, coffee, tobacco, etc. Cattle breeding and agriculture have declined in importance. Gold is mined, and rubber and hides exported. The cap., São Luiz de Maranhão, is a prosperous, well-built city on an island of the same name. Area 177,569 sq. m. Pop. 1,381,300.

Marano di Napoli, com. in the prov. of Naples, Italy, 5 m. N.W. of Naples. Pop. 11,000.

Marathon, see AMAZON.

Marans, chief tn. and seaport of Charente-Maritime, France, 18 m. from La Rochelle, on the Sèvre Niortaise. It is in the midst of marshy land intersected by canals. Pop. 4600.

Maranta, genus of perennials (order Scitaminaceae), with tuberous or creeping rhizomes, from which arrowroot is obtained, and ornamental leaves, green above and grey, purple, or rose below.

Maraschino, fermented juice of the marasca cherry, *Prunus avium*, the geman (marasca - amarascia, bitter), which was originally distilled in Dalmatia as a cordial, and is now produced elsewhere. It is flavoured with the kernels.

Marash, or Maras, tn. of Anatolia, Turkey, the chief tn. of the vilayet of M. E. of the Jihun R., at the foot of Mt. Taurus. There is a large trade in Kurd carpets and embroideries. The name Marasi is found in Assyrian inscriptions, and the tn., under the name of Germanicia-Marasion, played an important part in Byzantine history. Pop. (vilayet) 265,000, (tn.) 30,600.

Marat, Jean Paul (1743-93), Fr. revolutionary leader, son of Jean Paul M., a native of Cagliari. In 1759 M. went to Bordeaux for two years to study medicine. From Bordeaux he went to Paris, from there to Holland, and finally to London, where he practised his profession as a physician, his special study being diseases of the eyes. His other chief interest was the study of electricity. In 1773 he wrote his *Philosophical Essay on Man*, and in 1774 he pub. *The Chains of Slavery*. In 1775 he was made an M.B. of St. Andrews. He was now famous as a skilled physician, and the year 1777 saw him as the brevet physician to the comte d'Artois's guards. In 1789 he pub. his first journal, *L'Ami du Peuple*, and gradually abandoned his scientific life and studies for a political career. In 1789 he was arrested and suffered a month's imprisonment. In Jan. 1790 he fled to London, but returned to Paris and hid in foul cellars, where he contracted a loathsome and painful skin disease. He took a leading part in the struggle between the Jacobins and the Girondists. He called himself the 'martyr of liberty,' and after being tried and acquitted by the Girondist gov., he became more popular than ever with the Paris

Marathon

mob. After the republic was declared he began to edit *Le Journal de la République française*. He was one of those who were implacable towards the king, and demanded his death for the good of the people. The skin disease from which he suffered was so painful that only by lying in warm baths could he obtain relief. While sitting in his bath writing his journal, a young woman, Charlotte Corday (q.v.), demanded admittance. The girl was a Girondist and an enthusiast and, believing him to be a monster of bloodthirstiness, she stabbed him through the heart, convinced she had rid France of a terrible enemy. His works were ed. by A. Vermorel in 1869; and *Correspondance* by C. Villay in 1908. See E. Defrance, *Charlotte Corday et la mort de Marat*, 2nd ed.



MARAT ASSASSINATED
After the painting by J. L. David.

1909; also lives by A. Bourgeart, 1865; E. B. Vermorel, 1880; F. Chévremont, 1880; E. B. Bax, 1900; and P. Compton, 1935.

Maratea, tn. of the Neapolitan prov. of Basilicata, situated on the slope of a mt., in the midst of a lovely and salubrious country. Pop. 9500.

Marathas, see MARRATTAS.

Marathi Language, see under INDO-EUROPEAN LANGUAGES.

Marathon, tn. of anc. Greece, in Attica, on a plain between the mts. and the sea coast, about 20 m. N.E. of Athens. It is famous in mythology for the overthrow of the monstrous bull by Theseus, and in hist. for the victory of the Athenian, Miltiades, over the Persians. The date generally given is 490 B.C.; but the Cambridge *Ancient History* (iv, 245) has 'probably the 21st September, 491 B.C.'

Marathon Race, name given to the crowning event in the revival of the Olympic games held in normal times every four years at the cap. of the country chosen to

hold them. The name is also used for similar races held elsewhere, at the stadium, etc. The race—classic exemplar was the journey of Pheidippides to Athens bearing the tidings of the victory of Marathon. The race is usually over a course of 26 m. The race of 25 or 26 m. had no place in the Olympic games of ancient Greece. When the games were revived at Athens in 1896, a race from Marathon to Athens was included. The games were next held in Paris in 1900 and a race of similar length was run round the walls of the city. The games of 1904, in St. Louis, also included a 25-m. race. Then came the extra games of 1906, in Athens, and, naturally enough, another race from Marathon. London, in 1908, followed suit by organising a race from Windsor to the White City stadium, where the games were being held, and the event had by that time become fully established, and the distance stabilised so that times and performances could be compared. The exact distance covered in the 1908 race was found to be 26 m. 385 yards, and that has been the official distance of a M.R. ever since. The 1908 race in London was memorable for the disqualification of the It., Dorando Pietri (whose Christian name and surname were erroneously reversed on the programme), who was first into the stadium, but was in a state of collapse and helped over the line by officials. He received a gold cup from Queen Alexandra for his great effort.

Maratta, or Maratti, Carlo (1625–1713), It. painter and engraver, b. at Camerano. A pupil of Raphael. His Madonnas were particularly numerous and admired. He was entrusted by Clement XI. with the charge and restoration of the frescoes of Raphael in the Vatican, and was commissioned by Louis XIV. to paint his celebrated picture of 'Daphne.'

Maravedi, old Sp. coin in use until the end of the eighteenth century. Originally the name was used for Moorish coins, both silver and gold, but after 1494 it was only used for a small copper coin, in value about 7 centimes (*id.*), and a silver coin (1*d.*).

Marazion, or Market Jew, fishing vil. in the St. Ives, parl. div. of Cornwall, England; on Mount's Bay, 3 m. E. of Penzance. At low tide it is united to St. Michael's Mt. by a causeway of boulders. It was burnt by the Fr. in 1513 and again in 1549 during the Arundell rebellion in the reign of Henry VIII. Pop. about 1500.

Marbeck, or Merbeck, John (d. 1585), Eng. organist and musical composer. He took a leading part in a society formed at Windsor to promote the spread of Reformation doctrines, and narrowly escaped the stake. He composed the first book of chants for use in the Anglican Church, *Booke of Common Praier Noted* (1550). He also compiled the first concordance of the Eng. Bible (1550).

Marbella, tn. in the prov. of Malaga, Spain, on the Mediterranean, 30 m. S.W. of Malaga. It has iron mines and foundries in the neighbourhood, and exports salt fish, figs and wine. Pop. 10,000.

Marble, crystalline form of limestone.

The term is usually applied to those forms of limestone or dolomite which are sufficiently compact to take a high polish. A characteristic M. consists of granules of uniform size closely packed together. When broken the fracture presents a multitude of glistening facets, owing to the granules breaking along their rhombohedral cleavage planes. The colour is usually white, but markings of many hues and patterns are produced by the presence of metallic salts, either as constituents of the original limestone, or as later intrusions. All Ms. are probably metamorphosed limestones. The metamorphism has been brought about by great heat and pressure, the former produced by the near neighbourhood of igneous intrusions, and the latter the result of overlying masses. Much crushing, folding, and twisting have often taken place, so that streaks or bands of impurities in the original limestone frequently take on peculiar shapes. The economic importance of Ms. is derived from the adaptability of the finer forms to uses in statuary, and of the other forms to more or less ornamental architecture. Many fine Ms. were known to the ancients, of which Pentelic and Parian Ms. are the most famous. The former was obtained from Mt. Pentelicus in Attica, and served as the material for the Elgin Ms., now lodged in the Brit. Museum. Parian Ms. was quarried in the Isle of Paros; the Venus de Medicis was carved in stone from this source. The M. used by medieval and modern sculptors is that found in the neighbourhood of Carrara in Italy. Architectural Ms. are quarried from the Devonian system in Devon. In the U.S.A., Ms. is quarried in Tennessee, New York, Massachusetts, and California; onyx in Arizona, Colorado, and California.

Marble Arch, London landmark erected by George IV. and made by George Nash, as a gateway to Buckingham Palace, and, in 1850, removed to its present position by the N.E. corner of Hyde Park, London.

Marblehead, seaport and township of Essex co., Massachusetts, U.S.A., 16 m. N.E. of Boston, on Massachusetts Bay, settled by Eng. immigrants in 1629. It has a good harbour and some shipbuilding industry, and is a seaside resort and yachting centre. Pop. 10,800.

Marburg: 1. Or **Maribor**, tn. in Slovenia, Yugoslavia, 41 m. S. of Graz by rail. It has a large trade in leather, boots and shoes, iron and tin goods, liqueurs and sparkling wines, and is a summer resort. Pop. 33,100. 2. Tn. in Hesse, Germany, on the R. Lahn, 60 m. N. of Frankfort by rail. The chief buildings are the Elisabethenkirche, built in 1235–83, to contain the tomb of St. Elizabeth of Hungary, and the univ., founded in 1527. In the Second World War M. was taken by the 7th Corps of the Amer. Third Army on March 29, 1945. Pop. 33,000.

Marcantonio, or **Marcantonio Raimondi**, It. engraver of the fifteenth and sixteenth centuries, b. at Bologna. Until 1510 he worked as a goldsmith and engraver at Bologna, under Francia. From 1510 until the taking of Rome by the Spaniards

(1527) he lived there, engraving many of the best pictures of Raphael and his pupils.

Marcaria, com. in the prov. of Mantua, Italy, 13 m. S.W. of Mantua. Pop. 9000.

Marcasite, mineral consisting of iron disulphide (FeS_2). It is chemically identical with iron pyrites, and was formerly looked upon as a variety of pyrites. M. is yellowish-brown and has a brilliant lustre. It is mined at Littmitz near Carlsbad, and is used for the preparation of sulphur and ferrous sulphite.

Marcou, François Séverin Desgraviers (1769-96), Fr. general, b. at Chartres. He took part in the attack on the Bastille (1791), in the defence of Verdun (1792), and in the wars of the Vendée, and commanded at Fleurus (1794). He was in command of the 1st Div. of the Army of the Rhine, and fought at Lahn and at Altenkirchen where he was mortally wounded.

Marcel, Gabriel (b. 1887), Fr. dramatist and idealist philosopher. His philosophy, which has been described as the Christian expression of existentialism (q.v.), owes much to Bergson, Nietzsche, and Dostoevsky. He is concerned mainly with the problems of the theory of the method and grounds of knowledge and the importance of faith and intuition. His plays have given him a high p/w. in Fr. drama but are not markedly popular. Consistently with his philosophy they explore the value of faith in the lives of their characters and the necessity for love of God and of one's neighbour to achieve a satisfactory relationship with God or man. M. denies having a philosophy that belongs exclusively to him, or one which can be mathematically formulated; he avers that he is still seeking such a philosophy. The *Journal métaphysique* in which, since 1914, he has recorded his day-to-day reflections on the cardinal problems of metaphysics, was begun with the object of preparing the book in which he was to have expounded his system: but, after 'twenty years of meditations,' he has reached the 'melancholy conviction' that he will never write it (*Homo viator*). But unlike Kierkegaard, with whose Christian existentialism that of M. has some affinities, M. at least aspires to a systematic unity of thought. Much more than the Dan. essayist M. provides a type of Christian existentialist more philosopher than man of letters. M.'s method is comparable to that of Husserl, but aims at attaining to being itself; he is truly existentialist in that he practises a concrete philosophy; and he differs on this point from other existentialists by the capital importance he gives to the consideration of the body. Partaking both of a subjective and an objective nature, the body constitutes the intermediary which Descartes failed to find, in order to link the thinking mind with the external world. M. differs from Sartre and other atheist existentialists in that despair and anguish at the absurdity of life are no part of his attitude. For him as for other Catholic existentialists despair is no more than a transient temptation; hope is the texture of his life, and is its essential

condition. 'I am not far from believing that hope is to the soul what breathing is to the living being; where hope is lacking the soul wilts and exhausts itself' (*Homo viator*). In technique his plays are admittedly influenced by the sensualist Georges de Porto-Riche—who regarded love as a fever rather than an inspiration, as exemplified in *L'Amoureuse*—François de Curel, and, to a less extent, by Ibsen. Among them are *La Grâce* (1911); *Un Homme de Dieu* (1925); *La Chapelle ardente* (1925); and *Le Dard* (1938). His philosophical works include *Etre et avoir* (1935) and *Du refus à l'invocation* (1940).

Marcello, Benedetto (1686-1739). It. musical composer and author, b. at Venice. While holding various official positions he devoted himself to music and poetry. His masterpiece is the *Estro poetico-armorico* (1724), a musical setting of the first fifty psalms as paraphrased into It. by G. Giustiniani. He also wrote cantatas and an opera. His pamphlet, *Il Teatro alla moda* (1722), was a brilliant satire on contemporary opera. See monographs by L. Busi, 1884, and A. d'Angelis, 1940; also E. Fondi, *La vita e l'opera letteraria del musicista Benedetto Marcello*, 1909.

Marcellus, the name of two popes:

Marcellus I, succeeded Marcellinus probably in May 308. He imposed such severe penances upon all Christians who had recanted under the recent persecutions that he was banished by popular demand in 309.

Marcellus II, succeeded Julius III. in 1555, but d. the same year. As Cardinal Corvini he presided over the Council of Trent. Palestina dedicated a famous Mass to him.



MARCELLUS (I): FROM AN OLD COIN
The inscribed name is that of P. Cornelius Lentulus Marcellinus, who struck the coin.

Marcellus, Marcus Claudio: 1. Rom. general (c. 264-208 B.C.) during the second Punic war. In 222 B.C. during his consulship, he distinguished himself in battle by killing with his own hands Viridomarus, the king of the Insubrian

Gauls, whose spoils he afterwards dedicated as *spolia opima* in the temple of Jupiter Feretrius. This was the third and last time in Rom. hist. that this offering was made. In 214 he began a famous siege of Syracuse, which he finally took in 212. On the capture of the city Archimedes, who directed the engines which defended the tn., was put to death by the Rom. soldiers. In 208 M. was killed in a skirmish with Hannibal near Venusia. 2. Another Rom. of the same name (c. 43-23 B.C.), was the son of C. M. and Octavia, sister of Augustus. In 25 B.C. he was adopted by the emperor and married the latter's daughter, Julia. In 23 B.C. M. d. suddenly at Baiae, supposedly poisoned by Livia, to the grief of Augustus. He is the subject of a famous passage in Virgil, *Aeneid*, v. 861-87.

March, Agnes, Countess of, see BLACK AGNES.

March, Ausias (1397-1459), Catalan poet, b. in Valencia. His poems, which show the influence of Petrarch, were written in the dialect of Catalonia, and testify to the vivid imagination of the writer. His chief works are *Cants d'Amor* and *Cants de mort*, and others may be found in various eds., among them that of F. P. Briz (Barcelona), 1864. See monograph by A. Pages, 1912, and his *Commentaire sur les poésies d'Ausias March*, 1929.

March, Earl of, see MORTIMER, ROGER. **March**, tn. in the isle of Ely, Cambridgeshire, with a market on Friday. It is situated on the Nen, 81 m. N. of London. It manufa. a considerable variety of farm tools and has engineering works. There are extensive marshalling yards, and the tn. is an important railway junction. Pop. 14,000.

March, first month of the Rom. year, and the third according to our present calendar, consists of thirty-one days. It was considered as the first month of the year in England until the change of style in 1752, and the legal year was reckoned from M. 25th, as the fiscal year still is. The A.-S. called it *Hlyd monath*, stormy month, and *Hred monath*, rugged month. There is a proverb which represents M. as borrowing three days from April.

March, boundary, used more particularly of the Welsh Ms., and Scottish Ms., the border countries between England and Wales and Scotland respectively. The earl of March took his title from the Welsh Ms., and in the Middle Ages the governors of the border dists. were known as wardens of the Ms. The name is allied to the Ger. *Mark* (q.v.). See also BOUND, BEATING THE.

March, in music is, as its name indicates, a musical composition intended to regulate the step of marching troops. Written in common time and not too slow, it should have the rhythm sufficiently clear and well marked to make the march of the soldier natural.

Marchand, Jean Baptiste (1863-1934), Fr. soldier; b. at Thoissey, Ain. Enlisting as private in 4th Marines, 1883, he was commissioned in 1886, and saw active serv. in Senegal, 1888-91, being twice

wounded. In the course of numerous explorations in the African interior, he estab. (when major) the post of Fashoda on the White Nile, 1898. His refusal to withdraw on a demand made by the Brit. led to an international crisis. He was called home to report, and Fashoda was evacuated in his absence. A colonel in 1902. He commanded colonial troops in the First World War, becoming a general of div. in 1917. See also FASHODA.

Marchant, Sir Stanley Robert (1883-1949), Brit. organist and composer, b. in London. He was trained at the Royal Academy of Music, and was appointed sub-organist at St. Paul's Cathedral, 1916; organist, 1927; organist emeritus, 1936. Regarded as one of the most brilliant masters of the organ of his period. From 1930 to 1932 he was president of the Royal College of Organists. As organist at St. Paul's he directed the music at King George V.'s silver jubilee thanksgiving service in 1935. In 1938 he succeeded Sir John McEwen as principal of the Royal Academy of Music. He was King Edward professor of music at London Univ. from 1937. His compositions included some songs and many pieces of church music, one of which, a Te Deum, was sung at the jubilee service.

Marchena, tn. in the prov. of Seville, Spain, 30 m. E. of Seville. It is an old Moorish tn., some of the fortifications still remaining. It also has sulphur springs. Pop. 14,000.

Marches, Riding the, see BOUNDS BEATING THE.

Marches, The (It. *Le Marche*), region of Italy, comprising the provs. of Pesaro e Urbino, Macerata, Ascoli-Piceno, and Ancona. The region produces limestone, sulphur, wine, silk, and cereals. Before 1860 these states were included in the papal ter. Area 3750 sq. m. Pop. 1,352,000.

Marchfeld, plain in Austria, stretching in a northerly direction from Vienna, and in a westerly one from the March. It was the scene of the defeat of Ottakar of Bavaria by Rudolph of Hapsburg in 1278, and also of Napoleon's battles of Aspern and Wagram.

Marchienne-au-Pont, tn. of Hainaut, Belgium, 2 m. W. of Charleroi, on the R. Sambre. It has coal mines, blast furnaces, copper foundries, wire-drawing mills. It is one of the most important iron and steel producing tns. of Belgium. Pop. 21,300.

Marchin, tn. of Belgium, prov. of Liège, 16 m. E. of Namur. Pop. (com.) 6000.

Marcellinise, tn. in the prov. of Caserta, Italy, 13 m. N.E. of Naples, with which it is connected by rail. Pop. 15,000.

Marcianus, or **Marcian** (A.D. 450-57), emperor of the E., b. about 391. He entered the army at an early age, and served under Aspar, whom he accompanied in his campaign against Genseric, king of the Vandals, in Africa in 431, and under Ardaburius. He seems to have acquired great distinction, for on the death of the Emperor Theodosius the Younger (450), his widow, Pulcheria, offered him her hand in marriage, and he was crowned the same

year. During his reign he repelled attacks upon Syria and Egypt (452), and quelled disturbances on the Armenian frontier (456); he also refused payment of tribute to Attila, reformed the finances, and repeopled the devastated dists.

Marcianus, Aelius, Rom. jurist, who wrote after the death of Septimius Severus. His chief works are sixteen books of *Institutiones*; two books on *Publica Iuris*; two books on *Appellations*; and five books entitled *Regularia*.

Marcinelle, tn. in the prov. of Hainaut, Belgium, just S. of Charleroi. It has coal mines, blast furnaces, and quarries of marble and moulding clay. It manuf. steel goods and fireproof stone. Pop. 23,000.

Marcion, founder of the Marcionites, an ascetic Gnostic sect, was the son of a bishop of Sinope on Pontus. The gospel of Christ, according to him, consisted in free love of the Good; the Mosaic system, with its motives of rewards and punishments, was mere legality (see *Gnostics*). M. entirely rejected the O.T.; and of the N.T., all but a few epistles and part of the gospel of St. Luke. He is mentioned by Irenaeus in *Adversus Heresies* (c. 180), but our chief source of knowledge of his opinions, etc., comes from Tertullian's *Adversus Marcionem* (207). See E. Walder, *Marcion and the Roman Church*, 1929.

Marcomanni, powerful league of barbarians belonging to a Suevic tribe, who dwelt between the Danube and the Rhine after Caesar's death. Under their king, Marobodus, they made themselves masters of the country of the Boii, the present Bohemia. They subsequently made incursions into Rom. ter. during the reign of Marcus Aurelius, until A.D. 180, when peace was purchased by Commodus.

Marconi, Guglielmo, Marchese (1874-1937), It. inventor of the wireless-telegraphy system, b. at Bologna, son of Giuseppe M. and of his wife Annie Jameson, an Irish woman. He was educated first at Leghorn, under Prof. Rosa, and then at Bologna Univ. After a series of experiments in wireless telegraphy at Bologna, in regard to which he received no encouragement from the It. Gov., he migrated to England, where he was well received by Sir Wm. Freece, engineer-in-chief of the post-office telegraph system, and himself an experimenter in wireless. In 1899 he estab. wireless communications between France and England. In 1901 signals were received across the Atlantic from Poldhu (Cornwall) to St. John's (Newfoundland), a distance of 2100 m. Following on this, wireless telegraphy communications were estab. and formally inaugurated between Canada (Cape Breton) and England, when the governor-general of Canada and M. transmitted messages to King Edward VII. Communications were next estab. between Cape Cod, Massachusetts, and Cornwall. His system came to be used by Lloyd's and the prin. shipping companies in England and abroad, as well as by the Brit. and It. admiralties: the prin. warships of these navies were fully equipped as well as ships of the mercantile marine. M. instituted

a public wireless service between Bari (Italy) and Antivari (Montenegro). He made certain improvements in his system about 1910—a new valve receiver and a new electrolytic detector—and developed a duplex system. The rapid spread of wireless telegraphy had made Marconi Wireless Telegraph Company, Limited (estab. 1900), a very important concern with subsidiary companies in other lands. This company was originally founded in England as the Wireless Telegraph and Signal Company.

In 1902 he was created by the king of Italy commander of the order of St. Maurice and St. Lazarus, and received the grand cross of the order of the Crown of Italy. He received the freedom of the city of Rome in 1903, and was decorated with the order of St. Anne by the tsar of Russia. In 1909 he was awarded half the Nobel prize for physics, Stockholm. On Italy's entry into the First World War in June 1915 M. took charge of the It. wireless-telegraphy system. He was It. plenipotentiary at the Peace Conference, and signed the peace treaties with Austria and Bulgaria. In 1929 he was made marchese and an It. senator. In 1930 he became president of the It. royal academy, and a member of the council of the Fascist party. At his own wish he was buried at his native tn. of Bologna, and a state funeral was accorded him by the It. Gov. See J. de Boisod, *Marconi, Master of Space*, 1936; and life by B. L. Jacob and D. M. Collier, 1937.

Marco Polo, see POLO, MARCO.

Marœq-en-Barœul, tn. in the dept. of Nord, France, 3 m. N. of Lille. Pop. 22,200.

Marcus Aelius, see AURELIUS ANTONINUS, MARCUS.

Marcy, William Learned (1786-1857), Amer. politician, b. at Sturbridge, Massachusetts, U.S.A. Educated at Brown Univ., he practised law at Troy, New York Univ. He came to the front as a Democratic politician and became one of the 'Albany regency' which was reputed to decide the policy of the party in New York state. He was a U.S. senator in 1831-32 and during his term incidentally uttered the phrase afterwards so often heard: 'To the victor belong the spoils of the enemy' (see Parton's *Life of Jackson* (1860), vol. III.). He was governor of New York from 1833 to 1839; secretary of war under Polk, 1845-49, and secretary of state under Pierce, 1853-57. In the last named capacity he successfully conducted the Kosciuszko case (1854), which involved a dispute with Austria on the legal right of expatriation. All his political leanings were towards that branch of the Democratic party in New York which afterwards became the backbone of the new Republican party in 1856, and he might have been its natural leader had he followed his own convictions over the Kansas-Nebraska Bill.

Marcy, Mount, see under ADIRONDACK MOUNTAINS.

Marczaly, c. v. of Hungary, 98 m. S.W. of Budapest, near the E. shore of Lake Balaton. Pop. 4000.

Mar del Plata, tn. and holiday resort in

the prov. of Buenos Aires, Argentine Republic, on the coast near Cape Corrientes. Pop. 60,000.

Mardi Gras, Fr. name for Shrove Tuesday, the eve of Lent, and concluding day of the carnival, marked by a procession through the streets of a prize ox, a burlesque of an old Rom. sacrificial custom, together with mock priests, a band, and other merrymakers.

Mardin, tn. in the vilayet of M. Anatolia, 54 m. S.E. of Diyarbekir. It has a picturesque position on the side of a hill, and is the headquarters of an Amer. mission. Pop. (vilayet) 235,500, (tn.) 21,000.

Mardonius (Ικ. Μαρδόνιος), Persian general, the son of Gobryas. He was sent by Darius in 492 B.C. to complete the settlement of Ionia, and to punish Eretria and Athens for their share in the war, but lost his fleet off Mt. Athos and suffered defeat at the hands of the Bryges. On the succession of Xerxes in 486, however, he was again in favour, and was one of the chief instigators of the expedition against Greece. After the defeat of Salamis he persuaded Xerxes to return home, and being left in command of 300,000 men, sent a proposal to the Athenians to withdraw from the Gk. confederacy, and on their refusal occupied the city and reduced it to ruins. He next marched against the Ic. force, which was collected at the isthmus of Corinth, and following it to Plataea, was defeated and slain in 479 B.C.

Marduk (*Merodach*), mighty lord of Babylon, the Bel of the O.T. and Apocrypha. He rose into prominence under the conqueror Hammurabi (c. 2300 B.C.), who brought the upper and lower states of the Euphrates valley under one dominion, and set up Babylon as his cap. Bel of Babylon was invested with all the divine attributes of En-lil, the old Bel of Nippur. He was lord and light of heaven and earth, in whose hands were the decrees of fate and from early times had been a god of the morning light and of the spring sun. The Babylonian new-year's feast commemorated his victory over the primeval being and rebel Tiamat and the monsters of her creation, and his marriage with Sarpanitum, the Succoth-Benoth of 2 Kings, xvii. 30. M. was worshipped as a god of battle by the Babylonian kings, and some scholars identify him with Nimrod; others, however, identify the latter with Gilgamesh (q.v.). He was the son of Ea, the third of the great Babylonian triad of the gods, the others being Anu and En-lil, and he partook of his father's powers: he acted as intermediary between mankind and the latter, and like Ea was a god of the exorcist cult. He himself was the father of Nabu, or Nebo of the O.T., and was identified with the planet Jupiter. The creation legend ends with a hymn of praise to this god, on whom innumerable titles of honour are bestowed. See E. G. King, *Babylonian Religion and Myth*, 1899, and *Seven Tablets of Creation*, 1902.

Mare, see under LOYALTY ISLANDS.

Mare Caspium, or Hyrcanum, see CASPIAN SEA.

Maree Loch, Ross-shire, Scotland, a large and beautiful lake, 2½ m. long by 1

2 m. broad. It is surrounded by gorgeous mt. scenery, and studded with is. It is drained by the R. Ewe into Loch Ewo. **Mare Internum**, see MEDITERRANEAN SEA.

Maremma, marshy region of central Italy, in the S. part of Tuscany, extending along the coast of the Tyrrhenian Sea. It was practically all desert land, and virtually uninhabitable, but since the beginning of the nineteenth century, and especially under the regime of Mussolini, it has been widely drained and settled.

Marengc: 1. Vil. of Piedmont, situated about 2 m. S.E. of Alessandria. It was the scene of Napoleon's victory over the Austrians in 1800. 2. Tn. of Algeria, 38 m. W.S.W. of Algiers. Pop. (com.) 8000.

Marennes, seaport in the dept. of Charente-Maritime, France, 25 m. S. of La Rochelle. It has oyster fisheries and salt-works. Pop. (com.) 4000.

Marenzio, Luca (c. 1553-99), It. composer, b. at Coccaglio, close to Brescia. He occupied for a time the position of maestro to Cardinal d'Este, after which he went to Poland and was employed by Sigismund III. About the year 1595, however, he returned to Rome and became organist at the pontifical chapel. His most important works are his madrigals, of which there are nine vols.

Mareotis, Lake, see BIRKET-EL-MARUIT.

Mare's-tail, or *Hippuris*, genus of glabrous aquatic herbs (order Haloragaceae). The only Brit. species, *H. vulgaris*, occurs in ditches and stagnant water. Ms. are sometimes planted beside ornamental waters.

Mareuil, Arnaut de, see ARNAUT DE MAREUIL.

Margam, dist. of the bor. of Port Talbot, Glamorganshire, Wales, 4 m. S.E. of Aberavon. It is a coal-mining centre. Its chief building is the restored M. church, dedicated to the Virgin Mary, formerly a Cistercian abbey, of which the chapter-house and other twelfth-century ruins have survived. Some 3 m. N.W. of M. is M. Abbey, long the seat of the Talbot and Mansel families. In 1921 M. was amalgamated with Aberavon to form the bor. of Port Talbot. Near by are the new M. and Abbey works of the Steel Company of Wales, which are being built on a strip of marshland and dunes, ¾ m. wide and 3 m. in area, between the sea and the railway from Cardiff to Swansea. These 260,000,000 works are said to be the biggest single new industrial project under construction in Britain to-day. It is expected that by 1951 its 1300-yd.-long rolling mill will produce 1,000,000 tons a year of steel plate and 'hot strip.'

Margaret, St. (d. 1093), sister of Edgar Atheling. On the accession of William the Conqueror to the Eng. throne Edgar Atheling, his mother, and his sisters M. and Christina, went to Scotland, and M. became the wife of Malcolm III. of Scotland. Malcolm, enraged at the seizure of Carlisle by the Eng., laid siege to Alnwick (1093), and was defeated and slain. M. d. when she heard the news of her husband's death. See Lucy Menzies St. Margaret, Queen of Scotland, 1925.

Margaret, the 'Maid of Norway,' see FAIR MAID OF NORWAY.

Margaret (1353-1412), queen of Denmark, Norway, and Sweden, and daughter of Waldemar IV. of Denmark. At the age of ten she was married to King Haakon VI. of Norway, and on his death in 1380 the whole of Norway was placed in her hands. Her son, Olaf, whose election as king of Denmark she had procured, d. seven years later, thus enabling her to secure the throne to herself. Shortly afterwards she defeated Albert, the Swedish king, and obtained possession of the throne of Sweden. She combined Denmark, Sweden, and Norway into one kingdom, and was called the Semiramis of the N. See M. Hill, *Margaret of Denmark*, 1898.

Margaret of Anjou (1430-82), daughter of René the Good of Anjou, titular king of Naples, married to Henry VI. of England in 1445. She became regent for her husband because of his imbecility, and represented the Lancastrian cause in the wars of the Roses. Although successful at some of the battles, she was in the end defeated at Tewkesbury and taken prisoner with her son, who was killed, M. herself being imprisoned for four years. See Mary Hookham, *The Life and Times of Margaret of Anjou*, 1872; and J. J. Bagley, *Margaret of Anjou, Queen of England*, 1949.

Margaret of Carinthia, called Margaret Maultasch (1318-69), elder daughter of Count Henry of Tyrol and duke of Carinthia (1310-35), son of Meinhard II., count of Tyrol. She is known in Tyrolese hist. and legend as M. Maultasch, 'the pocket-mouth.' Louis IV., Ger. king and Rom. emperor (1314-47), secured the mastery of Tyrol by separating her from her husband, son of John, the powerful king of Bohemia, and making her (1342) the wife of his own son, Louis, to whom, in 1322, he had granted the march of Brandenburg. The son of M., duchess of Brandenburg, and Louis, Meinhard III., who succeeded to the county on his father's death in 1361, d. two years later. M. was finally forced to abdicate (1363) and thereupon assigned all her possessions to the house of Hapsburg, and from that time Tyrol formed part of the hereditary dominions of the archdukes of Austria. She is the subject of Feuchtwanger's *Die hässliche Herzogin* ('The Ugly Duchess'), 1926.

Margaret of Navarre (1492-1549) (also known as Margaret of Angoulême), sister of Francis I. of France, married to the duke of Alençon in 1509 and to Henry d'Albret, titular king of Navarre, in 1527. She never reigned in Navarre, but kept a court at Nérac. She afforded protection to the Protestant reformers, and was a patroness of art and literature. Besides being an enthusiastic patron of such men of letters as Rabelais, Clément Marot, and others, she was an accomplished writer herself. Her poetry is a curious mixture of gallantry and mysticism. In the *Chansons spirituelles*, which reveal the spirit of the Reformation, she shows genuine feeling. She also coin-

posed humorous epistles in the manner of Marot, and *dizains* on the model of Petrarch. She had already pub. *Le Miroir de l'âme pécheresse* (1531) and *Marquerites* (1547), when she planned a series of poetic narrations which were to form a 'Decameron' in imitation of Boccaccio. Her death prevented the completion of more than seven of the intended ten sections of the work. These seven were first printed in 1558, under the title of *Histoires des amans fortuneez*; the second ed., which appeared in the following year, was ed. by Claude Gruget, who gave it the title of *Heptaméron*. See M. W. Freer, *Life of Marguerite d'Angoulême*, 1895.

Margaret of Parma (1522-86), illegitimate daughter of the Emperor Charles V., first married to Alexander, duke of Florence (1533), and then to Ottavio Farnese, duke of Parma (1542). From 1559 to 1567 she was regent of the Netherlands. See monographs by F. Rachfahl, 1895, and Van de Essen, *Alexander Farnese*, 1933.

Margaret of Scotland (c. 1425-45), eldest child of James I. of Scotland and wife of the Dauphin Louis, afterwards Louis XI., whom she married at Tours in 1436. He disliked and neglected her, and she devoted a good deal of her time to poetry. She is said to have been a pupil of Alain Chartier. See J. J. Jusserand, *English Essays from a French Pen*, 1898.

Margaret (Margot) of Valois (1553-1615), daughter of Henry II. of France and Catherine de' Medici, married in 1572 to Henry of Navarre. On the massacre of St. Bartholomew, Henry fled from court and was not rejoined by his wife for six years. Later, she again abandoned him, and was finally divorced in 1599. Her *Mémoires* were pub. in 1628 (Eng. trans. by Violet Fane, 1892).

Margaret Rose, second child of King George VI. B. at Glamis Castle, Angus, Scotland, Aug. 21, 1930, honorary colonel of the Highland Light Infantry; commandant-in-chief, St. John's Ambulance Brigade Cadets. Visited S. Africa and S. Rhodesia with her parents and Princess Elizabeth, landing at Cape Town, Feb. 17, (1947) and returning Portsmouth harbour May 8. Visited Italy and France in 1949.

Margaret Tudor (1489-1541), daughter of Henry VII., and wife of James IV. of Scotland, whom she married at Edinburgh in 1503, the whole of her subsequent life being a series of political intrigues of one kind or another. She had three children by James, two sons, one of whom later became James V. of Scotland, and a daughter, Margaret, mother of Lord Darnley. Her great-grandson, James VI. of Scotland, succeeded Elizabeth as James I. of England. (See illustration, p. 14.)

Margaric Acid, an acid $C_{18}H_{32}COOJ_2$ which was supposed to result from the saponification of certain fats, melting point 60° C. but now known to be a eutectic mixture of stearic and palmitic acids. M. A. is obtained by the hydrolysis of cetyl cyanide by caustic potash. It is said to occur in certain dead tissues.

Margarine, butter substitute, was first made by Mège-Mouriès (in 1870), who was awarded the prize offered by Napoleon III. for the manuf. of an efficient butter substitute. In the preparation of M. a large variety of fats and oils are employed. They include animal fats such as oleo-M., lard and *premier-jus*; vegetable oils such as coconut oil, peanut oil, and cotton-seed oil; as well as the more recently manufactured hardened oils made by the catalytic hydrogenation of liquid oils such as whale oil and soya-bean oil, using nickel catalysts (see HYDROGENATION). To prepare M. a suitable mixture of liquid and solid fats and oils, having a melting point of about 22–27°C., is run in the melted state into a mixing vessel, which can be



MARGARET TUDOR

kept at a regulated temp. At the same time milk—and more recently artificial milk—which has been previously pasteurised, and soured by means of special lactic acid forming organism cultures, is run in and intimately mixed with the oils, so that complete emulsification takes place. About 30 gallons of milk and 30 gallons of water are needed for each ton of melted fat. The product is chilled by a spray of ice water subsequently, or by means of brine kept at a temp. of -7°C., after which it is rolled and mixed with salt, flavouring materials, and preservatives. Since the dietary importance of vitamins has been recognised, suitable quantities of these substances have been incorporated in M., thus greatly increasing its food value.

Margarita Island, in the Caribbean Sea, belonging to Venezuela, 45 m. long and from 5 to 20 m. broad. The name derived from the pearls formerly found in large quantities. It consists of two mountainous portions. The coasts are barren, but the interior is fertile, producing maize, cotton, coffee, sugar, etc.

Salt is mined. It was discovered by Columbus in 1498. Cap. Asunción. Pop. 69,200.

Margaritone d'Arezzo (c. 1215–92), It. sculptor, and architect, b. at Arezzo. The best known of his paintings is his 'Madonna, with Scenes from the Lives of the Saints,' now in the National Gallery. He also painted a 'Coronation of the Virgin,' in the Liverpool Institute.

Margate, seaport and municipal bor., in the Isle of Thanet, Kent, a few miles from the N. Foreland, and one of the most popular seaside resorts of England, 74 m. E. by S. of London. It has bracing air, excellent sands and bathing facilities, and a fine pier and jetty. Some damage was done in air raids in the Second World War, notably to the winter garden and near the jetty. Pop. 39,800.

Margaux, tn. in the dept. of Gironde, France, on the Gironde estuary, 16 m. N. of Bordeaux. It is a centre for Médoc wines. Pop. 2000.

Margay (*Felis tigrina*), species of tiger-cat about the same size as the domestic cat, native of the forests of Brazil and Guyana.

Margraf, Andreas Sigismund (1709–1782), Ger. chemist, b. at Berlin, studied chem. at Berlin and Strasburg, and medicine at Halle. In 1738 he was elected to the Berlin Academy of Sciences, in 1760 being appointed director of the physics class. He is noted for his discovery of sugar in beetroot. His papers were collected into two vols. of *Chymische Schriften* (1761–67).

Margilan, or Marghilan, tn. in the Uzbek S.S.R., 160 m. S.E. of Tashkend. It is in a healthy position, surrounded by gardens, and, according to local tradition, is the place where Alexander of Macedonia d. Its chief industries are silkworm culture and the manuf. of silk, woolen, and camel-wool cloths. Pop. 59,000.

Margin: 1. *In Business Generally*.—(a) In a transaction in which money is advanced on security, the difference between the amount advanced on the security and the market value of such security. As regards trustees mortgaging the property of their beneficiaries, the effect of the Trustee Act, 1893, is that a trustee must not lend more than two-thirds of the surveyor's valuation even if the surveyor advises that a greater proportion may be advanced. If he does he will be liable for any resulting loss; but this statutory precaution relates not to the nature, but apparently only to the value of the security, and hence a trustee who lends on property of a speculative or wasting character (e.g. factory, or other trade property) will probably be liable for loss irrespective of the proportion to value advanced. (b) In banking practice the M. depends on the nature of the thing charged or pledged, but may be said to fluctuate from 10 up to 25 per cent. (c) In 'cover' transactions (see COVER), or speculation upon Ms. through outside stockbrokers, the speculator deposits a certain M. or sum to cover prospective differences in price, which cover is said to

run off if the difference turns out to be greater than he anticipated.

2. In *Economics*.—In the Ricardian theory of rent that land which will just pay for cultivation if it be let at a nominal rent is said to be the M. of cultivation, and in the absence of exceptional circumstances land below that M. cannot be cultivated with profit. In regard to labour generally, there is a 'final' or marginal disability when the increment of utility from the given employment just balances the increment of pain (Jevons). In other words if the physical and mental disadvantages just outweigh the reward, no one will be found to perform the work. As regards consumers the term M. is used by Maria Edgeworth (*Palgrave's Dictionary of Political Economy*) to denote the utility procured by a unit of money, or in simpler phraseology, the outlay beyond which a consumer will not go. See A. Marshall, *Principles of Economics*, 1890, and J. M. Keynes, *The General Theory of Employment, Interest, and Money*, 1936.

Margrave (Ger. *Markgraf*, count of the mark), formerly a governor entrusted with the care of a 'mark,' or frontier (margravate), who stood immediately under the king or emperor. Margravates existed as early as the time of Charlemagne. In the twelfth century they became hereditary, and later a M. held the same rank as a prince of the empire.

Marguerite, general term for a number of daisy-like flowers in the section *Tubiflora* of the family Compositae. The common ox-eye daisy (*Chrysanthemum leucanthemum*) and the grand ox-eye (*C. alpinum*) are often so called; but the name specially applies to *C. frutescens*, the Paris daisy, with fine white or yellow flowers. The blue M. is *Felicia amelloides*.

Mari, autonomous republic of the R.S.F.S.R. lying to the N.W. of the Tatar republic. It is part of the N. forest area and there are large paper, wood-working, and cellulose plants. A canal connects the Volga with Kotlas. The inhabts. are remnants of an original Finnish stock. Cap. Josukhar-Ola.

Maria, Christina (1806-78), daughter of Francis I. of Sicily, and wife of Ferdinand VII. of Spain. On his death she became regent for their daughter Isabella II. In 1840 she was forced to abdicate in consequence of Carlist disturbances, and fled to France, where she lived for the greater part of her life.

Maria Laach, Benedictine abbey on the shores of the Laacher See, in the E. of the Rhineland, Germany. The five-towered church, a Romanesque masterpiece, was built from 1093 to 1177 and 1220 to 1230.

Mariana, Juan de (1535-1623), Sp. historian, b. at Talavera. He entered the order of Jesuits, was ordained priest in 1561, and subsequently held professorships of theology at Rome, at Loreto, in Sicily, and in Paris. He became famous after the pub. of his *Historiae de Rebus Hispaniarum* (trans. into Eng. as *General History of Spain*). Of this the first part, written in Lat., appeared in 1592; its success was such that he trans. it into Sp. and republished it with a second part in

1601; a third part followed in 1605. As a writer he seems to have incurred odium with different parties. His treatise, *De Rege et Regis Institutione* (1599), was held to favour the doctrine of tyranny; *De ponderibus et mensuris* (1599), aimed at the malversations of the duke of Lerma, caused him to be imprisoned. Other works: *Tractatus VII.* (1609) and *Schola in Veteris et Novum Testamentum* (1620). See J. Laure, *The Political Economy of Juan de Mariana*, 1928.

Marianas, see LADRONES.

Marianna, episcopal tn. of Minas Geraes, Brazil, 170 m. N.W. of Rio de Janeiro. Pop. 6000.

Marianne Islands, see LADRONES.

Mariano Comense, com. in the prov. of Como, Italy, 8 m. S.E. of Como, has an important silk industry. Pop. 7000.

Marianus Scotus (1028-52) Irish chronicler. He became a Benedictine monk, and entered the monastery of St. Martin at Cologne in 1058, passing his later life at the abbeys of Fulda and of Mainz. He left a *Chronicon Universale*, first printed at Basle in 1559.

Maria Theresa (1717-80), empress of Germany, the daughter of the Emperor Karl VI., was b. at Vienna. By the Pragmatic Sanction (q.v.) her father appointed her heir to his hereditary thrones. In 1736 she married Francis Stephen, Grand Duke of Tuscany, to whom she gave an equal share in the gov. when she became queen of Hungary and Bohemia, and archduchess of Austria, on the death of her father, Oct. 21, 1740. Prussia, Bavaria, Saxony, Naples, and Sardinia, stirred up by France, put forward claims to portions of her dominions, chiefly founded on the extinction of the male line of the house of Hapsburg. The War of the Austrian Succession, after lasting more than seven years, terminated in her favour by the peace of Aix-la-Chapelle in 1748. She lost only Silesia and Glatz, and the duchies of Parma, Placenza, and Guastalla, whilst, on the other hand, her husband was elected emperor. During the time of peace she made great internal reforms. She found in Kaunitz (q.v.) a minister possessed of the wisdom and energy requisite for the conduct of affairs. In the Seven Years war (q.v.) she joined with Russia and Prussia in the partition of a third part of Poland (1772). Galicia and Bukovina were added to her dominions between 1772 and 1777. The Bavarian War of Succession ended in her acquisition of the Innthal, but led to the formation of the Fürstenbund (q.v.). See lives by J. F. Bright, 1910; M. Moffatt, 1911; H. Kretschmayr, 1925; M. Goldsmith, 1936; and C. L. Morris, 1938.

Maria-Theresopol, see SZABADKA.

Marianské Lazné, see MARIENBAD.

Mariazell, tn. of Styria, Austria, 60 m. S.W. of Vienna. Its shrine of the Blessed Virgin is the object of a popular pilgrimage. Pop. 2000.

Maribo, Dan. co. which includes the is. of Lanland and Falster. Pop. 132,700. The cap., of the same name, is on Falster. Pop. 4400.

Maribojo, or **Maribojoc**, tn. on the is. of

Bohol, Philippine Is., exports tobacco and sugar. Pop. 10,000.

Maribor, see MARBURG.

Marica, tn. in the prov. of Rio de Janeiro, Brazil, on the shore of a coastal lagoon, 21 m. E. of Rio de Janeiro. Pop. 8000.

Marie, Alexandra Victoria, Dowager Queen of Rumania (1875-1938), granddaughter of Queen Victoria by her father, the duke of Edinburgh, who married the Grand Duchess Marie, only daughter of Tsar Alexander the Second. B. at Eastwell Park, Kent, she lived part of her life



E.N.A.

MARIE ANTOINETTE

in Malta when her husband commanded the Mediterranean fleet, and then in Coburg, Germany. She married in 1892 Ferdinand von Hohenzollern, who was to become king of Rumania. As a writer she began her career by penning various tales and legends connected with Rumania. For a brief time, after the death of her husband, and during the exile of King Carol, she (with the three regents of the country) ruled affairs. The most ambitious of her books was *The Story of my Life* (3 vols., 1934-35); the first two vols. describe her early years and her unhappy experiences as a young bride under the tutelage of King Carol I.; the third vol. contains a vivid picture of life in the unconquered part of Rumania behind the Ger. lines in 1917-18. In *My Country (1916)*, and again in *The Country that I Lore* (1925) she described Rumania as seen through the eyes of an artist and a poet. Her first child, Charles (Carol), was b. in 1893. There were five other children:

Elizabeth, who married, in 1921, the king of the Hellenes; Marie, who married King Alexander of Yugoslavia; Nicholas; Ileana, who married the Archduke Anton of Hapsburg; and Mirea (d. in infancy).

Marie Antoinette, Joséphine Jeanne (1755-1793), wife of Louis XVI. of France. She was the fourth daughter of Maria Theresa and of the Emperor Francis I., and was b. at Vienna. She married the dauphin of France, afterwards King Louis XVI. In 1770, but her unconventional behaviour and her extravagance made her very unpopular. On the accession of her husband to the throne (1774), her Austrian sympathies, and her opposition to the demands of the popular party, increased her unpopularity. At the outbreak of the revolution she showed indomitable courage. She was hampered by her weak and vacillating husband, as well as by her own self-will and inability to understand the point of view of her enemies. She was guillotined on Oct. 16. See *Mme Campan, Mémoires*, 1823; *de Lescure, La Vraie Marie Antoinette*, 1863; and G. Lenôtre, *La Captivité et la mort de Marie Antoinette*, 1897; also lives by E. and J. de Goncourt, 1858; M. de la Rocheterie (Eng. trans.), 1893; H. Belloc, 1909; K. Anthony, 1933; S. Zweig (Eng. trans.), 1933; and A. Leroy, 1946.

Marie de France, Fr. poetess of the late twelfth century who lived mostly in England. She trans. into Fr. from an Eng. version, 103 animal fables under the title *Ysopet* in octosyllabic couplets. She dedicated them to 'Count William,' identified with Wm. Longsword of Salisbury. Her other poems are twelve Breton *lais*, also in octosyllabic verse, and a long poem on the purgatory of St. Patrick. The *Lais* are delightfully fresh and graceful, the chief being *Le Chêre-feuille*, *Eliduc*, and *Milon*. The best ed. of the *Lais* is that of Karl Warck (1885), and of the lays and fables together, Roquetaut (2 vols., 1820). There is an Eng. trans. by Edith Rickert (1901), and paraphrases by A. O'Shaughnessy (1872). See monograph by E. Levi, 1924; also E. Hoepfner, *Les Lais de Marie de France*, 1935.

Marie de' Medici (1573-1642), daughter of Francis of Tuscany, and queen-consort of France, b. at Florence. In 1600 she was married to Henry IV. of France, and her eldest son, later Louis XIII., was b. in the following year. After Henry's assassination in 1610 she became regent, and was entirely under the influence of her It. favourites, Leonora Galigai and her husband, Concini, who was created marquis d'Ancre. In 1614 she was compelled to buy the submission of the discontented nobles, but in 1616 Louis XIII. asserted himself, ordered the assassination of the Concini, and virtually imprisoned the queen at Blois. In 1619 she escaped and headed a new revolt, but was reconciled to her son through the mediation of Richelieu, who then gained royal favour. Her attempts to displace Richelieu led to her exile to Compiegne in 1630, whence she escaped to Brussels in 1631, and later to Cologne. See Julia S. H. Pardoe, *Life*

and Memoirs of Marie de' Medici, 1852; A. P. Lord, *The Regency of Marie de Medicis*, 1904; L. Batifol, *La Vie intime d'une reine de France* (Eng. trans.), 1908; and C. J. Burckhardt, *Richeletie*, 1936.

Maria Louise (1791-1847), daughter of Francis I. of Austria, and second wife of Napoleon Bonaparte, whom she married in 1810 on the divorce of Josephine. She had one son, called the king of Rome, with whom she lived at Schönbrunn whilst Napoleon was in exile. In 1814 she was appointed ruler of the duchies of Parma, Piacenza and Guastalla by the Allies. A vol. of her *Correspondence* was pub. in 1887. See life by J. A. von Helfert, 1873; and the *Memoires* of her maid of honour, Mme Durand, 1885. See also F. Masson (ed.), *Diaries*, 1922; E. M. Oddie, *Marie-Louise, Empress of France, Duchess of Parma*, 1931.

Maria Galante, Fr. is. of W. Indies, S.E. of Guadalupe. Pop. 29,350.

Marienbad (Czech, *Mariánské Lázně*), watering-place of Bohemia, Czechoslovakia, 40 m. N.W. of Pilzen. It has a beautiful position among forest-clad hills, and possesses cold saline and chalybeate springs. As a watering-place it dates from 1808 and was a favourite resort of Goethe. Pop. 7200.

Marienburg, see NARBORK.

Mariendorf, tn. in Brandenburg, Germany, 4 m. S. of Berlin. Pop. 22,000.

Marienwerder, see KWIDZYN.

Marietta: 1. Co. seat of Washington co., Ohio, U.S.A., on the Ohio R., 50 m. S.E. of Zanesville. It manufactures, safes, and automobile and carriage accessories. Pop. 11,500. 2. Co. seat of Cobb co., Georgia, U.S.A., 18 m. N.W. of Atlanta. There is stock-raising, and marble is mined in the dist. Pop. 8600.

Mariette, François Auguste Ferdinand (1821-81), Fr. Egyptologist, b. at Boulogne. In 1850 he went to Egypt in search of Coptic MSS., and discovered the Serapeum and the catacombs of the Apis bulls. In 1858 he became keeper of the Egyptian monuments, and devoted himself to archaeological exploration of the Nile valley. He pub. *Le Sérapéum de Memphis* (1857); *Aperçu de l'histoire d'Egypte* (1864); *Abydos* (1870-80); *Dendarah* (1873-75); *Karnak* (1875); *Dier-el-Bahari* (1877); and *Itinéraire de la Haute Egypte* (1877).

Marigliano, tn. of Caserta prov., Italy, 12 m. from Naples. Pop. (com.) 13,000.

Marignano, see MELEGNANO.

Marigold, name for several flowering plants. The Fr., African, and Mexican Ms. (*Tegetes*) are valuable half-hardy garden plants. Seeds are usually sown under glass in March, and planted out at the end of May. The colours vary from pale lemon to brown, and bloom all the summer if faded flowers are removed. See CALEN-DULA and MARSH MARIGOLD.

Marigo, Le, see CAPESTERRE.

Marinsk, or Marinsk, dist. and tn. in the Novosibirsk Region of the R.S.F.S.R., on the Trans-Siberian Railway. It is a gold-mining centre, and there are brick-works, soap factories, and tanneries. Pop. (tn.) 12,000.*

Marikanve, Lake, largest artificial expanse of water in India, in N. Mysore. It is 35 sq. m. in area, the water being used for irrigation and power plant, and was finished in 1908.

Marin, tn. of Pontevedra prov., Galicia, Spain, 5 m. S.W. of Pontevedra on a bay of the Atlantic. Pop. 9000.

Marin, Le, tn. on S. coast of Martinique, W. Indies, 28 m. N.E. of Fort de France. The extinct volcano of Marin is near. Pop. 5000.

Marinduque, is. of the Philippines, S. of Luzon, N.E. of Mindoro. Boag (N.W.) is the chief tn. The port Marlanga is on the S.E. Rice, hemp, and coco-nuts are produced, and seepages of petroleum have been found. Pop. 50,000.

Marine Biology is that branch of biology concerned with organisms living in the sea. The scope of this science is very wide, for not only is it concerned with the nature and development of organisms, but also with the environment influencing their development. The effect of water on light, the pressure of water, the variability of its depth, air content, and salinity are all factors affecting marine organisms and determining their distribution. Consequently M. B. is closely associated with oceanography, hydrography, and biochemistry. (See articles on these topics.) The early development of M. B. has been slow and diffuse, and in many countries was directly or indirectly due to the fishing industry. Probably on account of the economic value of certain fishes, molluscs, and crustacea, general interest in marine zoology was aroused before interest was extended to the much wider subject of M. B., which was not really developed until the nineteenth century. One of the pioneers of M. B. was Karl August Möbius (1825-1908), who investigated Kiel Bay, and described its plants and animals and their ecology. Victor Hensen (1823-1911), also at Kiel, investigated marine plankton, the mass of organisms floating on the surface of the water, and invented a statistical method to advance the study of fishes used as food. The first 'Challenger' expedition (1872-75) did much to stimulate Brit. interest in M. B. The Marine Biological Association of the United Kingdom was founded in 1884, and four years later a laboratory was completed at Plymouth, primarily to facilitate research on food fishes and molluscs, and to improve the industries dependent on these. Its secondary aim was to increase the knowledge of marine life in general. The work of the Plymouth station has been concerned mainly with life in Plymouth Sound and in the Eng. Channel. Shortly before this station was opened a Scottish marine station was estab. at Granton. One large boat, the *Ark*, was used as a floating laboratory and aquarium; another, the *Medusa*, for sounding and dredging. In 1885 the Liverpool M. B. committee was formed to investigate the fauna and flora of the Irish Sea, and did much to advance knowledge of life and condition in this area. The work of the committee has, since 1920, been continued by the Dept. of Oceanography of Liverpool Univ.

In 1925 the Falkland Is. Dependencies initiated a series of voyages, first in Capt. Scott's old vessel, *Discovery*, and later in the better-equipped *Discovery II.*, whereby many new facts were elucidated, and new species discovered. In 1933 Dr. Wm. Beebe (q.v.) of the New York Zoological Society descended to the previously unexplored depth of $\frac{1}{2}$ m., and described the habits of animals which had previously been known from dead specimens only; more recently (1948) Prof. Piccard of Brussels attempted unsuccessfully to reach a depth of $2\frac{1}{2}$ m. off the coast of W. Africa. The Swedish research ship, *Albatross*, in 1948 collected specimens at over 25,000 ft. (a depth nearly equal to the height of Mt. Everest), and collected samples of the sea-bed from 30,000 ft. For the discovery in 1939 of *Latimeria*, a fish belonging to an order thought to have been extinct since the Cretaceous period (80,000,000 years ago), see the article on FISH.

Marine biological stations are now established on the coasts of most countries of the world, and contributions have been made to every branch of biological science. Amongst the interesting facts discovered is a distribution of plants and animals in the sea analogous to their distribution at different altitudes on land. In deep seas, as the depth of water increases, its temp. decreases, and plants and animals found near or at the surfaces of polar seas are found at some depth in the warmer seas. In this way some Arctic species spread continuously from pole to pole. Nitrogen-fixing bacteria flourish in colder seas, and consequently more plants are found in these than in warm ones. Another factor influencing plant distribution is the intensity of light. Blue-green and green algae are found on the surface and in shallow water, brown algae in slightly greater depths, and red algae at lower levels. From depths where sufficient light cannot penetrate, plants and the animals dependent on them are absent. Moreover, since these animals live in darkness, they are either blind or provided with luminescent organs. (See FISH.) In contributing its quota of new species of plants and animals, M. B. has helped to elucidate some of the problems of evolution. There is still considerable scope for research in this branch of biology. See also under ABYSSAL FAUNA; CEPHALOPODA. See The Cambridge Natural History, 1909; W. Beebe, Half Mile Down, 1935; E. G. Boulenger, A Natural History of the Seas, 1935; F. S. Russell, The Seas, 1936; L. R. Brightwell, Neptune's Garden, 1937; N. B. Eales, Littoral Fauna of Great Britain, 1939; M. Duncan, Wonders of Neptune's Kingdom, 1948; and F. D. O'meara, The Ocean, 1949.

Marine Engine, see STEAM ENGINE.

Marine Insurance, see INSURANCE.

Mariner's Compass, see COMPASS.

Marines. The Royal M. are essentially sea-soldiers. They may serve at sea, on land, and in the air, and though they have many of the characteristics of a military regiment, they have their own traditions, and mode of life. In rank they corre-

spond with the army, and the corps is commanded by a general. But they are an integral part of the Naval Service, their organisation being the function of the Admiralty. Every cruiser and heavier type of ship carries a detachment of the corps. On board they are trained to seamen's duties, they man part of the ship's armament, provide guards and sentries, and are ready to land, whenever required, as a military unit, to assist the navy in keeping the peace. The Royal M. also man the navy's landing craft flotillas. On shore they work frequently with the army and provide men for the Commandos, where they specialise in landings and general water-borne assault. Royal Marine officers may also volunteer to serve as pilots of naval aircraft. The uniform is blue, with red facings and white belts. On their colours the men bear the word 'Gibraltar,' in the famous defence of which fortress they bore an heroic part. M. were first estab. as a nursery from which to obtain seamen to man the fleet, by order in council of Oct. 16, 1664. During the great Fr. war the number of M. rose above 30,000 men, but a great reduction took place after peace was concluded. In the First World War their strength was about 40,000, and they proved valuable in such enterprises as Zeebrugge and Gallipoli, besides serving with the general forces elsewhere. See E. Fraser and L. G. Carr-Langton, The Royal Marine Artillery, 1804-1923, 1931. In the Second World War the M. fought in Norway (notably at Narvik), Holland, France, Crete, Singapore, on the Irrawaddy, and at Dunkirk, besides carrying out their seagoing duties of supplying a part of the armament of the ships in which they serve, and the bands. As to the last-named, a boy bugler sounded 'Actions Stations' at the R. Plate, and another bugler was a survivor of H.M.S. Prince of Wales. The M. were the first seaborne troops to land as spearhead of the allied invasion in Sicily, and among the first to land in Italy. In Crete, of the 2200 Royal M. who landed with the mobile naval base only 1000 returned. In Iceland it was the M. who surprised the Ger. consul-general at Reykjavik, and seized his confidential books and papers. On the Irrawaddy a force of M. formed a flotilla (Force Viper) which assisted in demolitions and fought a desperate battle with the Jap. at Padaung. Of the original force of 107 here only 48 eventually made their way to Calcutta. Madagascar was another of the scenes of successful operations of the M. Finally, the M. also took part in the amphibious operation of launching the invasion of Normandy in June 1944, and subsequently in the operations to cross the Rhine in 1945. See H.M.S.O., The Royal Marines: the Admiralty Account of their Achievements, 1939-43. 1944.

Marinette, co. and city of Wisconsin, U.S.A., co. seat of Marinette co., on the Menominee, 20 m. from Oconto. Lumbering is the chief industry. Bridges connect it with Menominee, Michigan. Pop. 36,200.

Marinetti, Emilio Filippo Tommaso (1876-1944), It. writer, b. at Alexandria, Egypt. While being the veritable founder of the It. poetic school of Futurism, his prin. work was written in Fr. M. claimed that futurism was the idea that inspired Cubism, Dadaism, and Surrealism in France, Imagism in England and America, and Expressionism in Germany.

Marinha-Grande, tn. of Estremadura prov., Portugal, 5 m. from Leiria, with noted glass manufs. It has a pine forest, 'Pinhal de Leiria.' Pop. 5000.

Marini, or Marino, Giovanni Battista (Giambattista) (1569-1625). It. poet b. at Naples, and a friend of Tasso. His works were very much admired by contemporaries throughout Europe. If, however, he achieved an enviable reputation as a writer of verse—mainly of a rather flamboyant nature—he earned an equally unenviable one for the dissipation of his life. His excesses were eventually the cause of his being obliged to leave Italy (where he had at last exhausted the patience of a wealthy patron) and retire to Paris, where he lived under the patronage of Marie de Medici. He subsequently returned to Italy, and d. at Naples. The term 'Marinism' connotes the influence of his ornate and affected style on early seventeenth-century It., Fr., and Eng. His works include *Canzone de baci* (1589); *Le Strage degli Innocenti* (trans. as *The Slaughter of the Innocents*) (1610); *Rime*, later eds. called *La Lira* (parts 1 and 2, 1602, part 3, 1614); *Dicerie sacre* (1614); *Epithalamio* (1616); *Il Rapimento d'Europa* (1618); *La Sampogna* (1620); and *L'Adone* (1623). See B. Croce, *Poesie rare*, 1913; R. Basalino (ed.), *Le più belle pagine di Giambattista Marino* (Civelli), 1925; and C. Culcas, *Poesie e prose*, 1930. See also lives by M. Menghini, 1888, and A. Borzelli, 1927; and C. W. Cabanis, *L'Influence de Giambattista Marino sur la littérature française dans le premier moitié du XVII^e siècle*, 1904.

Marino, tn. of Italy, on the Alban Hills, 13 m. S.E. of Rome, in the prov. of Rome; noted for wine. It was formerly a stronghold of the Orsini and of the Colonna (twelfth to fifteenth century). Pop. 10,000.

Mario, Giuseppe, Cavaliere di Candia (c. 1810-83), It. singer, the greatest operatic tenor of his time. For a short time he studied under Ponchard, Michelet, and Bordogni, making his début at the Paris Opéra in *Robert le Diable* (1838), and appearing in London (1839) in *Lucrezia Borgia*. He left the Opéra for the Théâtre-Italien (1840), toured in Russia (1845-50), and in America (1851). M. played in the operas of Rossini, Bellini, Verdi, and Donizetti, and was universally admitted to be the most perfect stage lover ever seen. M. sang with Giulia Grisi (q.v.) whom he married (c. 1844), for many years. He retired from the stage in 1867. See G. Pearce and K. Herd, *The Romance of a Great Singer*, 1910.

Mariolatry (Gk. *Μαρπία* and *λαρπία*, adoration), the worship of the Virgin Mary. This term is chiefly used by polemical writers as one of disapproval, to express the veneration paid to the Mother

of God, and to statues and pictures of her in the Rom. Catholic and E. churches. Protestant controversialists declare that the supreme worship of *λαρπία* is accorded to her, while Catholics and Orthodox maintain that it is only the highest veneration or 'hyperdulia' (*ὑπερδούλεια*), and that prayers to her, such as the 'Ave Maria' so constantly used, are but petitions imploring her intercession with Christ for sinners. From paintings of Mary in the catacombe it may be inferred that the earliest Christians felt a special veneration for her. Epiphanius, the Gk. father of the fourth century, wrote against the Collyridians, a sect who had inaugurated a sacrificial worship to the Virgin (see *Hær.* 79). The epithet *Γερόκος* ('Mother of God') was probably first applied to Mary by Alexandrian theologians in the third century. The Nestorian movement was a protest against the title *Θεοτόκος*, which was, however, solemnly affirmed by the Ecumenical Council of Ephesus (431). After this the full development of the cult of the Virgin, so obnoxious to Protestant controversialists, soon followed, and went unchallenged for many centuries. The Reformers of the sixteenth century protested against M., and it is condemned in the 22nd Article of the Church of England and in the Westminster Confession (chap. xxi. 2). See E. Pusey, *Eirenikon*, 1863, which should be read with J. H. Newman's *Letter to the Rev. E. B. Pusey on his Eirenikon*, 1866, for a summary of the controversy by able exponents. See also J. J. Bourasse, *Sunna Aurea da Laudibus Beatissimae Virginis Mariae*, 1866; J. Northcote, *Celebrated Sanctuaries of the Madonna*, 1868; Rudniki, *Die Berühmtesten Wallfahrtsorte der Erde*, 1891; Walsh, *Apparitions and Stories of Heaven's Bright Queen*, 1904; and T. J. Gerrard, *The Cult of Mary*, 1913.

Marion, Francis (1732-95), Amer. soldier, b. near Georgetown, S. Carolina. He served in 1759 as a lieutenant in Governor Lyttelton's expedition against the Cherokees, and in 1761 as a captain in that of Col. Grant. Appointed brigadier-general in 1780, the scene of his activities was the country between the Pedee and the Santee from Camden to the coast, and he gained many victories over the Brit. troops. In 1781 he was joined by Lee's legion, and took part in the battle of Entaw. After the war he was returned to the State Senate, and in 1790 was a member of the State Constitutional Convention.

Marion: 1. Co. seat of Grant co., Indiana, U.S.A., 57 m. N.N.E. of Indianapolis in M. co. Natural gas and oil are found. There are machine shops, and manuf. of iron, glass, paper, and rubber. Pop. 26,700. 2. Co. seat of M. co., Ohio, U.S.A., 45 m. N.W. of Columbus. It is a railway centre and manuf. of engines and farming implements, and has limestone quarries. Pop. 30,800. 3. Co. seat of Williamson co., Illinois, U.S.A., 92 m. from St. Louis, Missouri. Pop. 9200.

* **Marionettes**, full-length puppets made of wood, metal, or plastics, jointed and

controlled by a manipulator, from above the stage, by strings or wires. The name is thought to have been originally a diminutive of Marie. M. are of great antiquity, performances being recorded in Greece as early as 420 B.C., and of wide distribution. Almost every country, including China, Java, France, and Russia, has its own traditional types and sets of characters. Shakespeare, Ben Jonson, and Cervantes all mention them. In modern times there has been some revival, particularly in schools. See C. Magnin, *Histoire des Marionnettes en Europe*, 1862; Helen H. Joseph, *A Book of Marionettes*, 1920; and H. Whanslaw, *Everybody's Marionette Book*, 1935.

The Sierra Nevada borders it on the N.E. Much gold is produced. Cap. Mariposa, 137 m. from San Francisco.

Mariposa Lily, see CALOCHORTUS.

Mariquina, pueblo of Luzon Is., Philippines, 8 m. N.E. of Manila, on trib. of the Pasig R. Pop. 10,000.

Maris, name of a family of Dutch painters of the nineteenth century. Of the three brothers, *Matthijs* (1835-1917), *Jakob* (1837-99), and *Willem* (1843-1910), Jakob is perhaps the most famous. Matthijs studied at the academies of The Hague and Antwerp, and in Paris after 1869. His works are remarkable for tender colouring and poetic feeling, and include 'Souvenir d'Amsterdam,' 'The Little



E.N.A.

MARIONETTE THEATRE: INDIA

Mariotte, Edmé (c. 1620-84), Fr. mathematician and physicist, of whose life little is known. He was b. in Burgundy, was a priest by profession, and resided in early life at Dijon. He was one of the earliest Fr. experimental philosophers, and a member of the Académie des Sciences (founded 1666). His chief work, *De la nature de l'air* (1676), contains a statement of Boyle's law of gases, known in France as Mariotte's law. He was noted for his discoveries in hydrodynamics. M. discovered the law of elastic fluids which now goes by his name; that is, of the elastic force being exactly in the inverse proportion of the space which a given mass of fluid occupies. Subject to such alterations as difference of temp. may require, the formula derived from this law is now one of the fundamental parts of aerostatics. He discovered that air, and air in a state of condensation, exist in liquids. His *Collected Works* were pub. in 1717 and 1740. See Condorcet, *Éloge des Académiciens*, 1779.

Mariposa (Sp., butterfly), co. of central California, U.S.A., containing the Yosemite valley and the Mammoth Tree Grove with its famous sequoias (*S. gigantea*).

Daughter of the Artist Swan,' 'A Fairy Tale,' 'Mädchen mit Tauben,' 'Häusliche Geschnüte.' Jakob is especially noted as a landscape painter of water, clouds, and misty skies. He was a pupil of De Keyser and Van Lerie at Antwerp, and then of Hébert in Paris (1866-71). His works include 'Holländische Stadtansicht,' (1878); 'An Meeresufer,' 'Souvenir de Dordrecht,' 'Grey Tower, Old Amsterdam,' 'The Seaweed Gatherers,' 'The Baby and the Kitten,' (1877); 'A Village Scene.' See J. Veth in *Onze Kunst*, 1902; T. de Bock, *Leben*, 1904. Willem preferred the bright, cheerful aspects of nature. His works include 'Watende Kuhe,' 'Enten,' 'Ein Sonnentag.' Influenced by the Barbizon school, they in their turn influenced the growth of the Glasgow school. See P. Zilcken, *Peintres hollandais modernes*, 1893; M. Rooso, *Dutch Painters of the Nineteenth Century*, 1899; E. Fromentin, *Masters of Past Time*, 1912; R. H. Wileński, *Introduction to Dutch Art*, 1927; and see also life of Matthijs by E. D. Fridlander, 1921.

Marischal, Earl, title created by James II. of Scotland (c. 1458), and bestowed on Sir Wm. Keith. The Keith family since

the time of David I. had possessed part of Keith in E. Lothian. From the early seventeenth century the office of Great Marischal became hereditary in this family, being conferred as an honour by Bruce for their services from Bannockburn (1314) onwards. *George, fifth Earl* (c. 1553–1623), founded Marischal College, Aberdeen (1593). *William, seventh Earl* (c. 1617–61), became head of the N. Covenanters. He supported Charles II. (1650), but was taken prisoner at Aylith (1651). On the Restoration (1660) he became keeper of the privy seal of Scotland. *George, tenth Earl* (c. 1693–1778), fought for the Pretender at Sheriffmuir (1715), and was in consequence attainted, while the office of marischal fell into abeyance (1718). He escaped to the Continent, and finally served under Frederick the Great. See J. D'Alembert, *Floge de Milord Maréchal*, 1779; W. Buchanan, *Ancient and Noble Family of Keith*, 1820; R. Douglas, *Scottish Peerage*, II., 1904; R. Chambers, *Biographical Dictionary of Eminent Scotsmen*, 1832–34.

Marist. Member of the Rom. Catholic Society of Mary, devoted to the work of foreign missions, and to teaching. The M. Society was founded at Belley, France, in 1816. The M. fathers and associates lay maintain schools "over the world, and sev. missions in New Zealand and Polynesia.

Maritain, Jacques (b. 1882), Fr. writer, Ph.D. of the Sorbonne. Educated as a Protestant, but, being attracted by the character of St. Thomas Aquinas, he became a Rom. Catholic (1906), and conspicuous in the Catholic revival. Prof. at the Institut Catholique, Paris (1913–40), and regarded as the leading neo-Thomist of his times. After the collapse of France he joined the Institute of Medieval Studies, Toronto, and was visiting prof. at Princeton and Columbia univs. His *Art et Scolasticism* (1930), trans. into Eng. as *Art and Scholasticism* is a classic of erudition and subtlety, if somewhat too heavy. He belongs, however, rather to the philosophers and the historians than literaturo proper. Of his earlier works those trans. into Eng. include also *An Introduction to Philosophy* (1930); *Prayer and Intelligence* (with his wife) (1931); *The Angelic Doctor* (Aquinas) (1931); *The Degrees of Knowledge* (1932); *Freedom in the Modern World* (1935); and *True Humanism* (1939). His later works are *Introduction to Logic* (1937); *Science and Wisdom* (1940); *Living Thoughts of St. Paul* (1942); *Redeeming the Time* (1943); *Rights of Man and Natural Law* (1944); *Dream of Descartes* (1946); and *St. Thomas Aquinas: Angel of the Schools* (1948).

Maritime Alps, div. of the W. Alps on the frontiers of France and Italy, extending from the Col di Tenda (N.W. of the gulf of Genoa), N.W. to the Col de l'Argentière and alps of Dauphiné. E. and N.E. come the Cottian and Ligurian Alps. Among the chief peaks are Punta dell' Argentiera (10,794 ft.), Cima dei Gelas (10,286 ft.), Monte Matteo (10,128 ft.), Mont Pelat (10,017 ft.), Mont Clapier (9994 ft.), Mont Tinibbras (9948 ft.), Mont

Euchastrayre (9895 ft.), Monte Bego (9426 ft.). The chief passes include the Passo del Pagarin (Vésubie valley to Valdieri), Col della Ciriegia, Col de Pourriac (Tinée valley to Argentera), Col della Lombarda (Tinée valley to Vinadio), Col de la Cayolle (Var valley to Barcelonnette, carriage road), Col del Sabbione (Tenda to Valdieri). For the dept. of France see under ALPES-MARITIMES. See E. Ball, *Alpine Guide*, 1898; P. Garnier, *Mémoire sur les Alpes-Maritimes*, 1888; Sir W. Conway, *The Alps from End to End*, 1895; F. S. Smythe, *Alpine Journey*, 1934; and R. L. G. Irving, *The Romance of Mountaineering*, 1935.

Maritime Laws, see OLERON, JUDGMENTS OF, and SEA LAWS.

Maritime Province (Primorskaya Oblast'), former prov. of Asiatic Russia, extending along the Siberian coast of the Pacific from Korea to the Arctic Ocean, including Kamtschatka and small is. off the coast, later known as the Far E., and now Khabarovsk Region (q.v.) of the R.S.F.S.R.

Maritza (ancet. Hebrus), chief riv. of European Turkey, rising on the slopes of the Rilo-Dagh and Rhodope Mts. (N.E. Balkans). It flows through E. Rumelia, past Philippopolis and Adrianople into the N.E. Aegean Sea, near Enos. Length about 300 m., navigable for small vessels to Adrianople. A battle was fought on its banks (1364) between Ottomans and Serbs. There are coal-mines in the vicinity.

Mariuccia, see MAROZIA.

Mariupol, seaport in the Stalino Region of the Ukrainian S.S.R. on the N. coast of the sea of Azov, 63 m. S.W. of Taganrog. It has considerable coasting trade and exports corn and other cereals, coal, steel, etc. The iron and steel works at M. use the oolitic ores of the Kerch peninsula. There are also tanneries and flour mills. In the invasion of Russia in 1941 the Germans reached M. on Oct. 7, and after sev. days of hard fighting captured it. The Russians retook it on Sept. 10, 1943. Pop. 222,000.

Marius, Gaius (157–86 B.C.), Rom. general, b. near Arpinum, of humble origin, was brought up to despise the new Gk. culture then becoming so fashionable in Rome. He possessed the stern and severe virtues of an ancet. Rom., and at first he was characterized by great integrity and industry, but living in a licentious age his virtues soon degenerated into vices, and being without the tempering influence of literature and art, his sternness produced cruelty, and his love of country became love of self. He saw his first service in Spain (134) under the great Scipio Africanus, who raised him to the rank of an officer, and in 119 B.C. was elected tribune, becoming praetor in 115, in which capacity he subdued Further Spain. He distinguished himself in the war with Jugurtha, 109–106, and was elected consul for the first time in 107 (a great honour for a *norus homo*), finally with Sulla bringing the war to a close. He was next appointed to the chief command against the Cimbri and Tectoni, and defeated the invaders at Aquae Sextiae

(modern Aix) (102), and near Vercellae (modern Vercelli) on the Raudian plain (101), becoming consul for the fifth time the same year. In 100 he was again consul, but he had secured his election by means of the demagogues, Saturninus and Glaucia, and so had alienated the plebs. In consequence of this he went to Asia, but returned to take part in the Social war of 90, and when Sulla was appointed chief in command against Mithridates in 88, succeeded in getting the office transferred to himself. This led to an open rupture between the two generals which resulted in Sulla defeating M., who fled to the marshes of Minturnae. He subsequently went to Carthage, and returning to Rome in Sulla's absence became consul a seventh time, he and Cinna naming themselves to office without going through the form of an election. See A. H. Beesly, *The Gracchi, Marius, and Sulla* (4th ed.), 1884.

Marivaux, Pierre Carlet de Chamblain de (1688-1763). Fr. writer, b. at Paris. He began his literary work by a parody on Homer, but soon turned his attention to comedy and the novel. His work is characterised by its verbal affectation, afterwards known as *marivaudage*, and by its analysis of character. His works include *Marianne* (his most famous novel, 1731-41) and *Les Fausses Confidences* (1737). See life by G. Deschamps, 1897.

Marjoram (*Origanum*), genus of aromatic herbs. The leaves of sweet M. (*O. Majorana*) are used for seasoning. Oil of M. is used in farriery, and a dye is also obtained from the plant.

Mark, or John **Mark**, traditional author of the second gospel, is mentioned many times in the N.T., though nowhere by name in the Gospels. He is spoken of in Col. iv. 10 as the cousin (*ἀδελφός*) of Barnabas. His mother Mary (Acts xii. 12) seems to have been a woman of some position whose house was a frequent resort of the Christians of Jerusalem. He accompanied Paul and Barnabas on their return from the visit to Judea (Acts xii. 5), and later set out with them on the first missionary journey. On their arrival at Perga in Pamphylia he left them for some unexplained reason, and this defection later caused a sharp dispute between Paul and Barnabas which led to their taking different roads. We next read of M. as reconciled to Paul, and as being with him at Rome (Col. iv. 10; Phil. 24). Later he seems to have visited Asia (2 Tim. iv. 11). Tradition makes him the founder of the Church in Alexandria, and later legend weaves many elaborate myths around his name.

Mark, The Gospel according to St., second book of the N.T., is now very widely regarded by critics as the first of the Gospels to be consigned to writing. Eccles. tradition has held that St. Mark was its author, in accordance with the testimony of Papias (second century), who says that St. Mark was the 'interpreter' of St. Peter, and that he wrote his gospel at Rome from information derived from the apostle. In the last century the Tübingen school entirely reversed the

traditional view, and placed the second gospel later than the other two synoptic narratives, holding it to be an adaptation of these two works intended to remove all that could offend either of the two great parties of the Early Church which the Tübingen school postulated. This view may now be said to be entirely abandoned, and it may be considered as an ascertained fact of criticism that St. Mark's Gospel was used by St. Luke and the author of the first gospel. Harnack dates it between A.D. 65 and 70, so that the date offers no difficulty to accepting the traditional authorship, strengthened as its claim is by internal evidence. St. Mark's Gospel is characterised by great vividness of narrative and a wealth of incidental detail. There is no attempt at a literary style, effect being gained mainly by the repetition of words and ideas. Either St. Mark's Gospel or an earlier form of it was used in the compilation of both the other synoptic gospels. See commentaries by H. B. Sweete, 1902; A. W. Blunt, 1929; and B. H. Branscomb, 1937; see also H. B. Menzies, *The Earliest Gospel*, 1901; A. Lagrange, *L'Évangile selon St. Marc*, 1920; W. Lowrie, *Jesus according to St. Mark*, 1929; J. Chapman, *Matthew, Mark, Luke*, 1937; and article in J. Hastings' *Dictionary of the Bible*, 1898.

Mark: 1. Ger. geographical term, signified primarily the *mark* of a country's limits (the *march*); and hence was applied as a designation of the border countries or dists. of the Ger. Empire, conquered from the Slavonians, Hungarians, Wends, and other neighbouring nations. Thus we read of the Ms. of Austria, of N. Saxony or Brandenburg, Lausatia, Schleswig, Moravia, Steiermark, etc. The governors entrusted with the charge of these border dists., or *marks*, were called *Markgrafen*, corresponding to the Eng. and Scottish wardens of the marches (see MARQUIS). 2. The name of silver coin of Germany containing 100 pfennige. Originally it was a measure of weight (chiefly for gold and silver) used throughout W. Europe, and equal to about 3 oz. In 1194, after the Conquest, a M. represented in England 160d. (20d. to 1 oz.), or 13s. 4d., two-thirds of £1. In Scotland it only had one-twelfth of the Eng. value. Ms. were first issued in Germany about 1875. There are 10- and 20-M. gold coins, and 1-, 2-, 3-, and 5-M. silver pieces. The nominal value of the Reichsmark of 100 pfennige in Brit. currency was 11d., and that of the Duitschmark introduced in 1948 1s. 3d. On the depreciation of the M. in the period following the First World War see EXCHANGES, FOREIGN.

Markanda, see under SAMARKAND.

Mark Antony, see ANTONIUS, MARCUS. **Market** (from Lat. *mercatus*, trade). This word is used either of the fixed place to which purchasers and retail merchants resort for purpose of buying and selling (such as, in London, Covent Garden M. for fruit and flowers, Leadenhall M. for meat and poultry), or of a body of people met together for commercial transactions, such as the sale of provisions, live-stock, etc., exposed in public, often at a fixed

time and place. From early times the right to estab. a M. anywhere belonged to the Crown; market rights became very valuable, and their illegal assumption was checked by Edward I's 'Quo Warranto' inquiries. The word was not commonly used in England before the twelfth century. In the Middle Ages the term included weekly and semi-weekly Ms., and the ann. mart or 'fair.' Until comparatively recent times the duke of Norfolk owned the Ms. in Sheffield, and the duke of Bedford owned Covent Garden M. To-day nearly all the Ms. are owned and controlled by the city or bor. councils; while the great London Ms. are controlled by the City Corporation or the L.C.C. Many tns., e.g. Nottingham and Peterborough, had a large open square or M. place in which the M. was held, traders setting up their stalls there. Some of them remain. Cattle Ms. are still held in uncovered places, but these are now generally distinct from ordinary Ms. Owing to modern facilities of inter-communication there is little variation in the price of a given commodity at different places (*see also FAIR*).

M. is also used to describe the whole range of transactions, in a particular commodity, such as cotton or wool, or the dealings in credit instruments which form the money M. The London Stock Exchange with its numerous subdivisions (consols, foreign stock, mining, etc.) is an example of a highly organised M. See Elton and Costello, *Report for the Royal Commission on Market Rights*, i., 1889; J. Huvelin, *Essai historique sur le droit des marchés et des foires*, 1897; and C. Mangham, *Markets of London*, 1931.

Market Bosworth, see Bosworth.

Market Deeping, markt. tn. of Lincolnshire, England, on the Welland, 7 m. E. by N. of Stamford. Pop. 2000.

Market Drayton, or **Drayton-in-Hales**, markt. tn. of Shropshire, England, on the Shropshire Union Canal. It is an old tn. and is in the centre of an agric. dist. Agric. implements are made. There is a sixteenth-century grammar school, and near by is Bllore Heath, scene of a battle in the Wars of the Roses. Pop. 4800.

Market Gardening, *see under GARDENING*.

Market Harborough, par. and markt. tn. of Leicestershire, England, on the Welland and the Grand Union Canal, 16 m. S.E. of Leicester. It is a much frequented hunting centre. Corsets, patent foods, rubber goods, and brushes are among its manufcts. It has an old Gothic church and a seventeenth-century grammar school. Pop. (with Bowden) 10,700.

Marketing. A word used as an alternative to sales management (q.v.) to cover the two activities of advertising and personal salesmanship. There is a tendency in commerce to separate M. from all the other branches where possible. This is more generally the case among manufacturers than among wholesale and retail traders, the very nature of whose business is in itself M. Broadly speaking, the larger the percentage of the price of a commodity that can be earmarked for

selling costs, the greater the tendency to make M. a separate dept. In some speciality trades, that is trades in such goods as vacuum cleaners, cash registers, and books of reference, where sales are made direct to the ultimate consumers or users without passing through the ordinary channels of trade, an entirely separate business from that of production may be organised solely for the purpose of M. the commodity. It was once thought that the effect of spending money largely on press and poster would be to reduce other salesmanship costs; but, generally speaking, this expectation has not been fulfilled, and indeed so far from this having resulted, it has proved to be unremunerative to advertise at the existing high rates unless personal salesmen are sufficiently numerous to draw the full benefit of the outlay. Consequently, while non-advertising houses may send representatives to visit their customers at intervals of many weeks or even months, it is usually the advertising houses which provide for the fortnightly or weekly call.

The great bulk of the heavy business of the world is still done in commodities in which there is little or no national publicity. M. in many such cases is rather outside the range of ordinary commercial travelling as well as of advertising. It means rather the discovery of buyers and the adjustment of plant and works to meet their needs. The various forms of M. have brought into being a new class of educator: the teacher of salesmanship. In some of the modern univs. M. in its two forms of publicity and personal selling is recognised as one of the commercial subjects (*see also EMPIRE MARKETING BOARD*).

There is another sense in which the term M. is being largely used: co-operative or united M. A good illustration is the union of the farmers or fruit-growers of a suitable area to unite and nominate a single person or body to carry out their selling arrangements, the principle being that such a central authority could make more effective bargains and allow the growers more time and freedom for their other work. In recent years agric. M. boards have been instituted in Great Britain by agric. producers in order to obtain the advantages of long-term organisation as authorised by schemes framed under the Agricultural Marketing Acts, 1931-33. Important schemes for large-scale M. of agric. products include those dealing with pigs and bacon, milk and its derivative products, and hops. See *Report on Agricultural Marketing Schemes for 1936* (Cm. 5734 of 1938); *White Paper on Milk Policy* (Cm. 5533 of 1937); and *Hops: Report of Reorganisation Commission* (Ministry of Agriculture, Economic series). *See also the Livestock Industry Act, 1937*, which provides for the improvement of the facilities for the slaughter of live-stock and the rationalisation of the system of live-stock auction markets, the control being vested in independent commissions appointed by the gov. The Ministry of Agriculture and Fisheries now includes a new dept. known

as the Agric. M. Facilities Committee for Great Britain.

See H. M. Conacher, *The Agricultural Marketing Acts*, 1935; J. T. Horner, *Agricultural Marketing*, 1935; L. W. Lyde, *Man and his Markets*, 1935; D. W. Malott, *Problems in Agricultural Marketing*, 1938; and J. B. Condilico, *The Reconstruction of World Trade*, 1941.

Market Overt. The legal term M. O., or open market, is used in reference to the acquisition of a good title by the purchaser of goods where the seller's title was defective. The general rule is that the owner or his agent alone can sell so as to confer ownership, but among the various exceptions to this rule is the statutory provision (Sale of Goods Act, 1893, founded on the common law) that where goods are sold in M. O., according to the usage of the particular market, the buyer acquires a good title to the goods provided he buys in good faith and without notice of any defect or want of title on the part of the seller. As a fact, the buyer has no great protection, because (1) if the owner of stolen goods secures the conviction of the thief he gets his goods back again, the buyer being reimbursed from moneys found on the thief; and (2) although anciently, when shops were very few, the general practice was to sell and buy in markets and fairs, the almost universal rule at the present day is to buy in shops, and markets and fairs (apparently the Act includes 'fairs' or 'markets') are now more or less the survivals of a bygone age. In the City of London, however, every shop which is open to the public between sunrise and sunset on all weekdays is, by customary law, M. O. (The Shops Act, 1912, in no way affects this custom, and a City shop is still M. O., though it must close long before sunset on one day in the week.) But City shops are only M. O. for such goods as the shopkeeper proposes to deal in, nor (apparently) does the custom apply where the shopkeeper is himself the buyer. Outside the City, certain days are set apart by grant, prescription, length of time, or custom in which at the particular time, or vice versa, M. O. is held. The protection extends only to goods vendible in the market. The transaction, to be protected, must have begun and ended in M. O.; for example sale in a private room, or sale by sample where the bulk of the goods is transferred otherwise than openly, do not constitute sale in M. O. Also, in the case of markets in which tolls are payable, the buyer to be protected must pay the tolls due upon the sale. See J. Pease and H. Chitty, *The Law Relating to Markets and Fairs*, 1899.

Market Rasen, markt. tn. and urb. dist. of Lincolnshire, Eng., on the Little Rasen R., and 13 m. N.E. of Lincoln. Pop. 2500.

Market Research. see under SALES MANAGEMENT.

Markham, Mrs. (1780–1837), pseudonym of Elizabeth Penrose, daughter of Edmund Cartwright (q.v.), inventor of the power-loom; married the Rev. John Penrose in 1804. She is noted as a writer of hist. and other books for the young.

The best known are *Mrs. Markham's History of England* (1823) and *Mrs. Markham's History of France* (1828). Other works include *Amusements of Westernheath, or, Moral Stories for Children* (1824); *A Visit to the Zoological Gardens* (1829); and *Sermons for Children* (1837). See S. Smiles, *A Publisher and his Friends*, 1891.

Markham, Charles Edwin (1852–1910), Amer. poet, b. at Oregon City, Oregon, worked on farm in California. He wrote many poems, the prin. of which was *The Man with the Hoe* (1899), which secured him world-wide attention. He was asked by the U.S. Gov. to write the poem to be used in the national celebration of Washington's bi-centennial birthday. He was elected to the Amer. Academy in 1930 and became honorary president of the Poetry Society of America. His other works include *Lincoln and other Poems* (1901); *The Shoes of Happiness*, etc. (1915); *Gates of Paradise* (1920); *California the Wonderful* (prose, 1924); *The Ballad of the Gallows Bird* (1926); *The Star of Araby* (1937); *Collected Poems* (1940); and *Children in Bondage* (prose, 1911).

Markham, Sir Clements Robert (1830–1916), Eng. traveller and geographer, b. at Stillingfleet, Yorkshire, son of the Rev. David F. M., vicar of that place. Educated at Cheam and Westminster, he was in the navy, 1844–52, and served in the Arctic expedition, 1850–51. He introduced quinine-yielding cinchona-trees from Peru to Brit. India, 1859–62, and also the *Herva brasiliensis*, or rubber-bearing tree, into Malaya. M. was geographer to the Abyssinian expedition; assistant-secretary to the India Office, 1867–77; secretary to the Royal Geographical Society, 1863–88; secretary, 1858–87, and president, 1893–1905, of the Hakluyt Society. Among his works are lives of Lord Fairfax, Columbus, John Davis, Maj. Renouf, Adm. J. Markham, R. Hakluyt, and Sir L. McClintock; also *Travels in Peru and India* (1862); *Memoir of the Indian Surveys* (1871); *The Threshold of the Unknown Region* (1874); *Life of Richard III*, (1906); *Quichua Dictionary* (1908); and *The Incas of Peru* (1910).

Markham, Gervase (Jervis) (c. 1568–1637), Eng. soldier, translator, compiler, and miscellaneous writer. During the Civil War he served in the Royalist Army. He wrote much, among his original writings being *The most honorable tragedie of Sir Richard Grivile, Knight* (1595); *The Poem of Poems: or Sion's Muse* (1595); *The dumb Knight* (comedy, 1608); *The English Husbandman* (1613, 1614); *Hunger's Prevention* (1621); *The True Tragedie of Herod and Antipater* (with Wm. Sampson, 1622); and various works on sport and rural pursuits, including *A Discourse on Horsemanshippe* (1593) and *A Way to get Wealth* (1631). See D. F. Markham, *History of the Markham Family*, 1854; and Sir C. R. Markham, *Markham Memorials*, 1913.

Markiewicz, Constance Georgine, Countess (1884–1927), Irish politician, daughter of Sir Henry Gore-Booth, and wife from

1900 of a Polish count. Active first in the Labour and then in the Sinn Féin movement, she was sentenced to death for taking part in the Easter 1916 rebellion, the sentence being commuted. In de Valera's Fianna Fail Gov. she was made minister of labour. She was the first woman to be elected to the Brit. House of Commons, being returned for St. Patrick's Dublin in Dec., 1918, but she never took the oath nor her seat.

Markinch, burgh and coal-mining centre in the co. of Fife, Scotland, 11 m. S.W. of Cupar and 33 m. from Edinburgh. The other chief industries are bleaching and the manuf. of paper. It is served by the Scottish Region railway. Pop. 2000.

Markinch, see STW. MAINE-AUX-MINES.

Mark Ink, see INK.

Markneukirchen, tn. of Saxony, Germany, 28 m. S.S.W. of Zwickau. It is chiefly engaged in the manuf. of musical instruments. Pop. 8700.

Markova, Alicia (Alice Marks) (b. 1911), Eng. *danseuse*. Joined Diaghilev's Russian ballet in 1925, dancing the *adagio* of *The Swan Lake* in the same year. After Diaghilev's death she danced with the Young Eng. Ballet at the Camargo Society, the Ballet Club, Sadler's Wells, and with her own company. With Anton Dolin (an Englishman who became *premier danseur classique*) she was the first star of the Vic-Wells Ballet founded by Ninette de Valois (see BALLET). As the particular star of the Wells company the ballets were constructed round her personality and aptitudes and the classics revivified for her such as *The Swan Lake*, which was first produced in 1877. In *Giselle*, the oldest (1841) ballet in the pre-war repertoire of the Wells company, M. gave an excellent rendering in a role in which Pavlova was supreme. Other classic roles in which she danced were *Casse-Noisette* and *Turandot's Wedding*. In physique and temperament M. is a classical dancer in the direct line of Pavlova and Spessivva. She occupies a unique position in contemporary ballet and has played a major part in the hist. of the art in England.

Markovka, tn. in the Voronezh Region of the R.S.F.S.R., 150 m. E.S.E. of Kharkov. Pop. 8000.

Markranstadt, tn. of Saxony, Germany, 7 m. S.W. of Leipzig. Pop. 8000.

Mark System. The name applied to the agrarian polity, common to all auto-Tentonic races, by which the whole arable land of the community or settlement was annually or triennially allotted among the freemen, to be held till the time came for it to lie fallow, while the pasture land was both held and used in common. The M. S. as described in Tacitus is evidently a sign of the transition between the nomadic and agric. conditions of tribes, or between a genuine community of land tenure and an inchoate system of private ownership (Geffroy, *Rome et les barbares*). The term mark (In *Tacitus ricus*) in this context meant 'community,' but its primary meaning 'boundary' points to the salient feature of the M. S. as described by Tacitus, namely, the fact that the

tribal habitations and fields were, for purposes of defence, bounded by huge unoccupied stretches of waste land or 'marches.' Despite much controversy it seems probable that the M. S. preceded the feudal system, which everywhere reduced the freeman to a condition of serfdom or villeinage. In England, at any rate, the M. S. failed to take root with the migration of the Saxons (see TENTHIE). For the social, political, and judicial aspect of the M. S., see R. Schmid, *Gesetze der Angelsachsen*, 1832; H. Maine, *Village Communities*, 1871; W. Stubbs, *Constitutional History of England*, vol. i., 1875; G. L. von Maurer, *Geschichte der Markenverfassung, Dorf-Hof-Stadtverfassung, und Eintritt*; T. Hodgkin, *History of the Anglo-Saxons*, 1906; R. Collingwood, *Roman Britain and the English Settlements*, 1923; A. Dopsch, *Die freien Märkte in Deutschland*, 1933; and F. M. Stenton, *Anglo-Saxon England*, 1943, 1947.

Mark Twain, see CLEMENTS, SAMUEL LANGHORNE.

Marl, loose appellation for all compounds of clay and carbonate of lime which are soft and friable. Shell M. is a soft white, crumbling deposit formed on the bottom of lakes and ponds by the accumulation of the remains of mollusca, entomorpha, and partly of fresh-water algae. When such calcareous deposits become compact stone, they form what are known as fresh-water or lacustrine limestones, which are generally white or pale coloured, smooth in texture, rarely splintery, and break with a slightly conchoidal fracture. Cricket pitches are treated with M. in order to bind and improve the turf.

Marlborough, John Churchill, first Duke of (1650-1722), Eng. soldier, was educated at St. Paul's School, and was for a while page to James, duke of York. He entered the army in 1667 as ensign in the foot guards, and, after serving at Tangiers, was promoted captain (1672). In 1678 he became colonel, and in the same year married Sarah Jennings (1660-1744), maid of honour to Princess Anne, over whom she had great influence. He was created Baron Churchill in 1682, and three years later took an active part in suppressing Monmouth's insurrection. For this service he was made major-general. He vowed fidelity to James II., and at the same time promised William of Orange to support him. When William landed, Churchill joined him. He was given an earldom in 1689, and after serving in Flanders, was in 1690 appointed commander-in-chief. On the accession of Anne he was made captain-general of the forces and master-general of the ordnance; and, on the declaration of war against France, commanded the forces in Holland. After the successful campaign of 1702 he was created duke. One of England's greatest soldiers, a brilliant exponent of the use of mobility and fire-power, among his great victories were Blenheim (1704), Ramillies (1706), Oudenarde (1708), and Malplaquet (1709).

In the meantime his influence at home was steadily waning, partly owing to changes in the political atmosphere, partly

to the imperious behaviour of the duchess of Marlborough towards the queen, who in 1710 dismissed her from her service, and partly to Harley's intrigues. Peace was declared by the Tories in 1711, and Marlborough, returning to England, was accused of malversation and dismissed from all his offices. The charges of peculation were, however, not proceeded with. He went abroad during the following year, and took an active part in securing the Hanoverian succession. After the accession of George I, he was reinstated as captain-general and master of the ordnance, which offices he held until his health gave way in 1716. He was hardly a scrupulous statesman, but due account



DUKE OF MARLBOROUGH

Engraving after a painting by G. Kneller.

must be taken of the times in which he lived. The most serious charges laid against him are that he betrayed James II, and William III, in turn; but such charge should be consistently made against all the great nobles who supported the bloodless revolution of 1688. Again, it is true that M., in common with Danby, Shrewsbury, and most of William's ministers conducted a correspondence with the Jacobites of St. Germains. This was well known to William, who was quite content that James should be duped with flattering but vain assurances that England was prepared to revolt on his behalf. Macaulay's more serious charge that M. communicated to the enemy the Eng. Gov.'s intention to attack Brest in 1694 has been convincingly refuted in Mr. Winston Churchill's *Marlborough* (4 vols., 1933-38; 2 vols., 1947). His letters and dispatches were pub. by Sir G. Murray (1845-46). See lives by D. B. Chidsey, 1929; Sir J. Fortescue, 1932; and M. Ashley, 1939.

Marlborough: 1. City in Middlesex co., Massachusetts, U.S.A., 25 m. W. of Bos-

ton. It carries on a considerable trade in boots and shoes. Pop. 15,100. 2. Tn. in the co. of Wiltshire, England, on the R. Kennet, 26 m. N.E. of Salisbury. It is an old tn. with interesting buildings, and a college for boys (see MARLBOROUGH COLLEGE). It was here Henry III. held the Parliament which enacted the 'Statutes of Marlbridge.' Pop. 5800. 3. Dist. in S. Is., New Zealand, having an area of 4220 sq. m. The chief minerals found are gold, coal, and copper. Pop. 17,000.

Marlborough College, Eng. public school, was founded in 1843 for sons of the clergy, being opened to laymen's sons ten years later. It accommodates about 660 boys, partly in hostels, and partly in boarding houses. It is situated at Marlborough, Wiltshire.

Marlborough House, mansion in Pall Mall, London, built by Wren for the great duke of Marlborough c. 1710, and since 1817 owned by the gov. It has been used as a residence by Edward VII, when Prince of Wales, Queen Alexandra, and Queen Mary, widow of George V.

Marline-spike, or **Marlinspike** (from *marline*, a small line of two strands for seizings, etc.), wire pin used on board ship for unravelling the strands of a rope and as a lever in tying knots, etc.

Marlow, or **Great Marlow**, tn. in Buckinghamshire, England, on the Thames, 5 m. N.W. of Maidenhead. The riv. is crossed here by an iron suspension bridge. There are extensive beech woods, and the surrounding scenery is remarkably attractive. The chief manufs. are paper and lace. Pop. 6500.

Marlowe, Christopher (1564-93), Eng. dramatist and poet, was the son of a shoemaker, and was educated at King's School, Canterbury, and Corpus Christi College, Cambridge. Presently he joined the earl of Nottingham's theatrical company, by which most of his plays were produced. He wrote about 1587 the great blank verse tragedy, *Tamburlaine*, and followed this with *The Troublesome Reigne and Lamentable Death of Edward the Second, King of England* (1594); and *The Tragedy of Dido Queen of Carthage* (with Nash, 1594). After his death appeared *The Massacre at Paris* (c. 1600); *The Tragical History of D. Faustus* (1604); and *The Famous Tragedy of the Rich Jew of Malta* (1633). A number of other plays have also been wholly or partially ascribed to M., and it has been asserted by some critics that he was part author of Shakespeare's *Titus Andronicus*, of the second and third parts of *Henry VI.*, and of *Edward III.* As a poet he is best known as the author of 'Come live with me and be my love' (pub. in *The Passionate Pilgrim*, 1599). It was declared that M. was an atheist, and in 1593 the Privy Council issued a warrant for him to be brought before them. Before it was served M. was killed in a drunken brawl at Deptford. M. raised both the themes and treatment of the drama to a higher level by taking large serious subjects for dramatisation that appealed to popular imagination, and by converting the old stiff blank verse into a medium of

delicate and plastic beauty. His plays show no outstanding power of characterisation or even of constructive skill, but they carry the reader away by the force and beauty of their language and by the heroic visions they conjure up. *Tamburlaine*, his earliest, crudest creation, enters on the stage driving a team of kings before his chariot; M. found the raw material for his play *Tamburlaine* in such books as Pedro Mexia's *Life of Times* (pub. at Seville in 1543 and trans. into Eng. in 1571) and the *Vita Magni Tamerlani* of Petrus Perondinus. But the thunderbolts of invective were his own, and it is the dramatist who makes the Scythian peasant and mass murderer into a poet. *Tamburlaine* is no doubt an expression of the overwhelming prodigality of youth, but in the play M. lit the fires of Eng. heroic drama. By contrast his poem *Hero and Leander* reveals him in a gentle mood of sweet sensuousness in the vein of Spenser. Barabas in *The Jew of Malta* rules the world by the power of gold; Faustus sells his soul for the powers of a magician; each is impelled by a lust of power and the tragedy consistently follows its appointed course from vaulting triumph to a tremendous fall. In technique M.'s highest achievement is his *Edward II.*, but in poetry and psychological interest it falls well below *Doctor Faustus*, which latter became the accepted model of the finest philosophical drama of modern times, Goethe's *Faust*. *Doctor Faustus* is a great symbolic tragedy on a theme which, besides reflecting M.'s inner experience, exploits that pride of intellect which was the very spirit of the Renaissance. The story is of the Middle Ages but M., by giving it a renaissance setting, thereby transformed the anxious alchemist into an ardent idealist, besides softening the crude horrors of the medieval version. The opening scenes in which Faustus barters his soul, are admirable, and the closing presentation of the hour of retribution touches a fund of pathos which seems to have been exhausted in this play, for M. never reaches it again. The weakness is in the middle scenes, some of which are so grotesque that some have doubted M.'s authorship. *Edward II.* is, comparatively speaking, a sober play, and even if it missed the fire and glamour of *Tamburlaine*, its structure is better and its interpretation of character more varied. M. not only saw that the romantic drama was admirably suited to the spiritual requirements of the needs of the nation as expressing its full and strenuous life; but also that for the romantic drama to achieve beauty as well as force the medium of blank verse must be used. M. no doubt shows the defects of the temperament of his age—excess of imagination, a lack of restraint, and at times an extravagance approaching the ridiculous, but no criticism can hide the fact that M. found the drama crude and formless and left it a mighty force in Eng. literature. His Works have been ed. by A. H. Bullen (1885); Havelock Ellis (1887); O. F. T. Brooke (1910); and R. H. Case (1930–33). See A. W. Verity, *Marlowe's Influence on*

Shakespeare, 1886; J. H. Ingram, *Marlowe and his Associates*, 1904; Una M. Ellis-Fermor, *Christopher Marlowe*, 1927; P. H. Kocher, *Christopher Marlowe*, 1947; and C. Norman, *The Muses' Darling*, 1948.

Marmagao, seaport tn. in the Portuguese ter. of Goa, India. It is connected by rail with the W. Ghats, and is in the centre of a manganese and iron dist.

Marmalade, see JAM.

Marmande, tn. in the dept. of Lot-et-Garonne, France, on the Garonne, 30 m. N.W. of Agen. It manufs. cotton and wooll-n goods and brandy. Pop. 12,100.

Marmolata, highest mt. of the S. Tyrol, Dolomites, Italy. Height 11,020 ft.

Marmont, Auguste Frédéric Louis Vieille de, Duke of Ragusa (1774–1832), marshal of France, b. at Châtillon-sur-Seine, entered the army at an early age, served as a brigadier-general in Egypt, returned with Bonaparte to France, supported him in the revolution of the 18th Brumaire, and afterwards continued in active military service. Having defended the Ragusan ter. against the Russians and Montenegrins, he was made duke of Ragusa. He joined the Grand Army in 1809, the day before the battle of Wagram, won the battle of Znaym, and was made a marshal. He was thereafter for eighteen months governor of the Illyrian provs. M. succeeded Masséna in Spain in May 1811. On the news of Soult's defeat by Beresford at Albuera (May 16) he moved rapidly southward, forcing Wellington to give up his siege of Badajoz. Deadlock ensued for two months, and in fact the offensive spirit of the Fr. was gone. From Aug. to Sept. Wellington blockaded Ciudad Rodrigo, and M., seizing upon an opportunity afforded by the dispersed condition of Wellington's troops, advanced. He refused to close with his enemy, who succeeded in taking up prepared defensive positions; Wellington's manoeuvres were, in Graham's words, 'very pretty—but spun rather fine.' In 1812 Wellington went over to the offensive, captured Ciudad Rodrigo and Badajoz. M. being hampered by Napoleon's fatal system of trying to conduct the Sp. operations from Paris. In June Wellington advanced into Leon, and M. retired behind the Douro to await reinforcements. In July he took the offensive, manoeuvred Wellington from his positions, and threatened his communications with Portugal. Both armies then moved on parallel lines, M. attempting, but failing, to cut his opponent's retreat. At Salamanca (July 22) M. made the fatal mistake of over-extending his line, in his persistent attempt to menace Wellington's retreat. The latter seized his opportunity and attacked. M. was completely defeated and beat a precipitate retreat, with the loss of nearly 15,000 men. In 1813 he commanded a corps d'armée, and fought at Lützen, Bautzen, and Dresden. He maintained t.e contest with great spirit in France in the beginning of 1814, and it was not until further resistance was hopeless that he concluded a truce with Barclay de Tolly, on which Napoleon found himself compelled to abdicate. On the return of

Napoleon from Elba he was obliged to flee. On the outbreak of the revolution in 1830, at the head of a body of troops, he endeavoured to reduce Paris to submission, and finally retreating with 6000 Swiss, and a few battalions that had continued faithful to Charles X., conducted him across the frontier. From that time he resided chiefly in Vienna. In 1852 he engaged in an effort for the fusion of the Fr. Legitimists and Orleanists, but d. at Venice on March 2 of that year. His memoirs were pub. 1857-58.

Marmontel, Jean Francois (1723-99). Fr. novelist and dramatist. b. at Bort in Limousin. An acquaintance with Voltaire brought him to Paris in 1745. Voltaire introduced him to sev. persons of distinction, and the success of his first tragedy, *Denis le Turc* (1748), stamped him as a dramatic poet. His celebrated *Contes moraux* (1765) gained him great reputation. On the death of D'Ulos he became historiographer of France; and in 1783 he was made secretary to the Académie in the place of D'Alembert. He lost his appointments and his property on the breaking out of the revolution, and he removed some distance from Paris in a state of destitution. In 1796 he became a member of the National Institute. His best achievement was the posthumous *Mémoires d'un père* (1804). See K. Knauer, *Ein Künstler poetischer Prosa in der französischen Vorromantik*, 1936.

Marmora, Alfonso Ferrero La, see La MARMORA.

Marmora, Sea of (anc. Propontis), between Europe and Asia, connected with the Aegean Sea by the strait of the Dardanelles, and with the Black Sea by the Bosphorus. Its length is 175 m. and its greatest breadth about 50 m., while in some parts it is over 4000 ft. deep. Among the is. in this sea is that of M., celebrated for its marble quarries.



Marmosets, or Oquistitis (Hapalidae), family of S. Amer. monkeys, sometimes called bear-monkeys (*Arctopithecini*) from their somewhat bear-like extremities, the feet having paws and claws which are

necessary for the M.'s mainly insectivorous habits. The face is short, and the thirty-two teeth include only two molars on each side. The tail is not prehensile. M. are all arboreal in habit, climbing and jumping with great activity. They are not very intelligent, but their gentleness and pretty appearance make them interesting pets. The common M. (*Hapale jacksoni*) is about the size of a squirrel, with darkish brown fur and long bushy tail marked with alternate rings of black and grey. The side of the head bears a long tuft of whitish hair over the ears.

Marmot (Marmota), genus of rodents, usually ranked among the Muridae, but regarded as forming a connecting link between that family and Sciuridae; resembling squirrels in their dentition, although in their form and habits they more resemble rats and mice. They have two incisors and two premolars in each jaw, four molars on each side above, and three below. The common M., or alpine M. (*M. marmota*), is a native of the Alps, the Pyrenees, and the more N. mts. of Europe, up to the limits of perpetual snow. It is not a native of Britain. It is about the size of a rabbit, greyish-yellow, brown towards the head. It feeds on roots, leaves, insects, etc., and is gregarious, often living in large societies. It digs large burrows with sev. chambers and two entrances, generally on the slopes of the mts. They spend the winter in their burrows, in one chamber of which is a store of dried grass, but the greater part of the winter is passed in torpidity. The alpine M. is easily tamed. The Quebec M., found in Canada in woody dists., is a burrowing but not a gregarious animal.

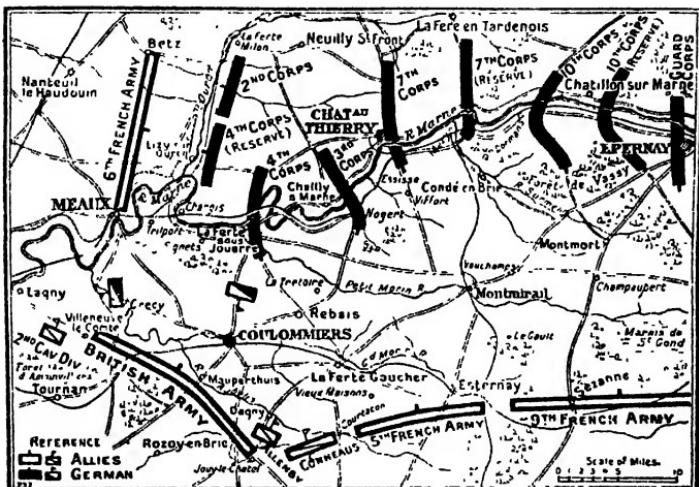
Marne: 1. Riv. of France, the anc. Matrona, the longest trib. of the Seine on the right. It rises in the plateau of Langres, and joins the Seine at Charenton, 4 m. above Paris. Its length is 325 m., and it is navigable for 126 m. It is rather a rapid stream, and in most places with a wide bed. The commerce carried on upon this riv. has been extended by means of canals, which link up the Rhine and the Aisne. The most important of these is the one completed in 1851 connecting it with the Rhine. 2. Inland dept. in the N.E. of France, formed out of the old prov. of Champagne, is traversed by the R. Marne, and extends southward from the frontier dept. of Ardennes. Area 3167 sq. m. The soil is very fertile in the S., but chalky and arid in the N. The surface is undulating in the centre of the dept., the remainder being of a level character. It is in the dry and chalky soil of the N. of this dept. that the best varieties of the famous Champagne wines (q.v.) are grown. Other industries include tanning, iron and copper founding, brewing, and pottery manuf. The rearing of a Sp. breed of sheep is a chief branch of industry, and woolen manufs. are largely carried on. Cap. Châlons-sur-Marne. Pop. 386,900.

See also MARNE, HAUTE-.

Marne, Battles of the (1914; 1918). The first battle of the M. (fought Sept. 6-9, 1914) was one of the decisive battles of the First World War (and of all time), and had

a direct bearing on Germany's ultimate defeat. The victorious sweep of the Ger. right wing under von Kluck (q.v.) pressed back the Allies' left flank, first in a S.W. direction, changing to S., then S.S.E., in an endeavour to envelop it and bring about a hasty collapse, in accordance with the approved Ger. plan. The Brit. Expeditionary Force was on the left of the Allies' line for a time, but in retreating to S. of the M., Joffre (q.v.), the commander-in-chief, formed a new army under Gen. Maunoury on the Brit. left. He formed another new army under Gen. Foch, which took up a position in the centre of the left section of the Allies'

line move caused a gap to appear on Kluck's left and Bülow's right, at which the Brit. struck with great effectiveness, and drove the Gers. back beyond the Grand Morin and Petit Morin. This disorganised the entire Ger. front on this flank, and at 11 a.m. on Sept. 9 Kluck received the order to retire. This exposed von Bülow's right still more, and gave Foch the opportunity for which he had been waiting. A considerable number of Gers. being held fast in the bogs about the marshes of Saint-Gond, Foch struck hard at Bülow's centre, right, and left. Maunoury had also driven the Gers. from the Ourcq and the Brit. then crossed the



THE FIRST BATTLE OF THE MARNE, 1914

The Times

line which faced N., holding the debouches to the south of the marshes of Saint-Gond and posting a part of its forces on the plateau to the north of Sézanne.' When von Kluck changed direction he exposed his own right flank to Paris, and Gen. Gallieni (q.v.), the governor, communicated with Joffre as soon as this movement became discernible. Joffre, thereupon, made arrangements to fall upon Kluck as soon as he was deeply committed to the new direction. He allowed him to advance over the M. and the Grand Morin. On Sept. 1 Joffre issued orders for an attack to be launched on Sept. 6. The situation on Foch's front was extraordinary, in that there existed a gap fifteen kilometres wide, but fortunately a similar gap existed in the Ger. line. Great pressure was brought against the Allies' line towards the E. of the marshes of Saint-Gond on Sept. 8. Maunoury, on the extreme left, however, now began to attack Kluck, who realising that he had exposed his right flank, at once faced W. to meet the danger. This sud-

M. at Château-Thierry (q.v.). The Ger. right was now in full, but orderly, retreat. See C. le Goffic (trans. by Lucy Menzies), *Foch at the Marne*, 1918.

The second battle of the M. arose out of the final Ger. offensive. This offensive was launched in March 1918, and the initial result was the creation of a large salient in the Allies' line in the direction of Amiens. In May a great effort was made by the Gers. between Soissons and Rheims to break through to Paris. On this occasion the M. was reached about Château-Thierry. On July 15 the Gers. launched a further offensive in this area and crossed the M. between Château-Thierry and Rueil (E. of Rheims), thus creating another and dangerous salient. Against the W. face of this bulge Foch launched a Franco-Amer. force on July 15, the Amers. capturing Courchamps, Torcy, and Belleau. The fighting was very stubborn, and 16,000 prisoners and fifty guns fell to the Allies. This victory showed the weakness of the Ger. position on the M., and they gradually withdrew.

They recrossed to the N. bank by July 20, under pressure, but without undue loss. Château-Thierry was abandoned the next day, and the withdrawal continued daily but the retiring forces clung desperately to Buzancy (q.v.), which was not taken until July 29. On the 31st the Amers defeated the Gers. at Seringes, thus wiping out the salient altogether. This ended the second battle of the M. See also FRANCE AND FLANDERS; FIRST WORLD WAR; CAMPAIGNS IN; WAR, THE FIRST WORLD.

Marne, Haute-, dept. of N.E. France, formed from the S.E. part of Champagne, with parts of Burgundy, Lorraine, and Franche-Comté, divided into three arrs.: Chaumont, Langres, and Vassy. The centre of the dept. is formed by the plateau of Langres, the highest point being Haut-du-Sec (1655 ft.) in the S.W. To the N.E. are the Monts Fauvilles. The low country forming the remainder of the dept. is called the Bassigny. The dist. contains the upper basins of the Marne, Ourcq, and Aube, trib. of the Seine, the Meuse, and some small trib. of the Rhône. There is considerable forest land. The soil is mostly poor, but cereals and vines are produced in parts. There are iron-mines and mineral springs. Cap. Châlons, Arca 2420 sq. m. Pop. 181,800.

Marnix, Philipp van, Baron Sint Aldegonde, see SAINTE ALDEGONDE.

Maroc, or Marocco, see MOROCCO.

Marochetti, Carlo, Baron (1805-68). It. sculptor, settled in Paris after 1827, and was a pupil of Baron Bosio. His works include 'A Girl Playing with a Dog' (1827); 'The Battle of Jemappes,' a relief on the Arc de Triomphe of Paris; equestrian statues of Emmanuel Philibert and the duke of Orleans; and in Great Britain an equestrian statue of Richard Cœur de Lion (1851), now at Westminster. Statues to Queen Victoria (1854) and Wellington at Glasgow, and the Inkerman monument at St. Paul's are by him.

Maronites, oriental religious body, so called from their Syrian founder, St. Maro (fl. before 423). Their first home was Mt. Lebanon, and they also dwelt in Anti-Lebanon and Hermon, and near Antioch. Originally Monothelites, becoming prominent in 713, owing to the Monothelite controversy, they became united to the Rom. Church (c. 1182), and since 1216 have been steadfast Catholics. Their head, styled the patriarch of Antioch, resides at the monastery of Kanobin on Mt. Lebanon. In 1584 a Maronite college was founded at Rome for training their clergy. See Schnurrer, *De ecclesia Maronitica*, 1810; F. J. Bliss, *Palestine Exploration Fund Quarterly Statement*, 1892; and P. Dilé, *Étude sur la liturgie maronite*, 1919.

Maroons, or Nègres Marrons (Sp. *cimarrón*, fugitive, or, possibly, *cima*, mt.-top), name applied in Jamaica and Dutch Guiana to runaway Negro slaves. The term was first used of the Negroes of Jamaica who fled from their defeated Sp. masters to the mt. fastnesses in the W. Indies after the Eng. occupation of Jamaica (1655). They long resisted the

Brit. colonists and, although treaties were made with them from time to time, they were not finally pacified until 1796, when, following a rebellion and the Maroon war (the cost of which was £350,000), many of them were transported to Nova Scotia and thence to Sierra Leone. In the same period the M. of St. Lucia also gave trouble to the Eng. Gov. and the is. was designated by the Fr. Convention 'the Faithful' on account of the support which its inhab. gave to Fr. revolutionary principles (see ST. LUCIA). Maroon Town, once called Trellawny Town, in Jamaica, where the M. made their last stand against the gov. in 1795, has practically disappeared, and Accompong, still a Maroon settlement, is also in the wild and romantic Cockpit country a dist. about 150 sq. m. in area in the W. central part of the is.

Maros River, riv. in Rumania and Hungary, and a trib. of the R. Theiss, which it joins at Szegedin. It rises in the Carpathians and is 450 m. long.

Maros Vasarely, tn. and the cap. of Maros-Torda co., Hungary, on the Maros R., 52 m. N.N.E. of Sibiu. Pop. 25,000.

Marot, Clément (c. 1496-1544), Fr. poet, b. at Cahors, son of Jean des Marcs, surnamed Marot—one of the *rhetoriqueurs*—through whose influence he was introduced to court circles and entered (1518) the service of Margaret d'Alençon, afterwards queen of Navarre. In 1525 he accompanied the campaigns of Francis I. in Italy (1520 and 1525) and is said to have been wounded and taken prisoner at the battle of Pavia. Soon afterwards he was imprisoned for heresy (c. 1526) despite his protestations, but through the intervention of Margaret, his patroness, he was set at liberty some months later. He had, however, made enemies by his witty satires against the Sorbonne and, being suspected of sympathies with Protestantism, had to flee to the court of Queen Margaret and later to that of the duchess of Ferrara. He returned to France in 1536 on condition of a formal recantation, but once more he was forced to leave France, his trans. of the Psalms (I. to I.) (1543) having been condemned by the Sorbonne (this work was subsequently completed by Boza). M. went to Geneva, but the austerity demanded of the true Calvinist was beyond him and he went on to Turin, where he d. The works of M. consist of trans. and allegories such as the trans. of the *Métamorphoses* (books I. and II.), his *Temple de Cupido* (1515), his *Adolescence l'émeline* (1532-33), and his allegorical satire *Enfer; ou chants royaux, rondeaux, ballades, et épigrams*; of occasional pieces such as *éternelles* and *blasons*; and of his trans. of the Psalms (1541). In poetic inspiration and education M. belongs to the preceding century and his learning is that of the Middle Ages. Boileau indeed exaggerates when he credits M. with new and original rhythmical combinations, for M. changed very little in the traditional medieval verse-forms and although he occasionally shows the influence of the classics, Virgil or Catullus or Ovid, he remains essentially a national poet. He is a poet of charm

but not of higher flights and his work is in the main pretty rather than beautiful. But his great service to Fr. poetry is that he restored naturalness and simplicity and replaced artificial excess of ornament and allegory by native grace. His rondeaux, epigrams, epistles, and ballades are examples of his best poetry. Among the most notable are the two epistles to the king, one *Pour avoir été dérobé* and the other *Du temps de son exil à Ferrara*, and his famous rondeau *Au bon vieux temps au train d'amour regnoit*. In epigram he has rarely been surpassed and indeed the phrase 'Marotie style' refers to this kind of verse. Le Fontaine and others imitated the *style marotique*. His *Collected Works* appeared in 1538 and 1544; P. Jannet's ed., 1868-72; Piffet's ed., 1885; G. Giffrey's ed., I.-III., 1875-81; IV.-V., 1929. See lives by E. O. Douen, 1878-79; H. Morley, 1871; P. A. Becker, 1926; and J. Plattard, 1938; also C. A. Sainte-Beuve, *La Poésie française au XVII^e siècle*, 1828, and C. E. Kinch, *La Poésie satirique de Clément Marot*, 1940.

Marozia, or Mariuccia, Rom, lady of the tenth century (*d. c.* 938), daughter of Theodora, noted for her beauty and profligacy. She married successively Alberic I. of Tuscany, Guido of Tuscany, and Hugo, king of Italy, and was probably mistress of Pope Sergius III. She had Pope John X. deposed and murdered (*c.* 928), and was instrumental in raising her sons John XI., John XII., and Leo VII. to the papal throne. She had thus entire control of Rome for some years, but was imprisoned by her son, Alberic II. (932).

Marple, urb. dist. and par. in the co. of Cheshire, England, 9 m. S.E. of Manchester. It is engaged in cotton manuf. Pop. 7400.

Marpelate Controversy, Puritan attempt to defy the power of Whitgift, archbishop of Canterbury, and the Star Chamber. John Penry commenced the struggle in 1587 with a petition to Parliament accusing the bishops and clergy in Wales of gross neglect of their duties. He was arrested, but only suffered a slight imprisonment. Then from 1588 the country was flooded with bitter pamphlets issued from a secret press under the pseudonym of 'Martin Marprelate,' possibly Job Throckmorton, but John Udall was one of the suspected authors. The *Cambridge History* (iii. 378 ff.) dates the first extant pamphlet Nov. 1588, and the seventh and last Sept. 1589. These were answered in equally bitter and unrestrained language by the Anti-Martinists, chief among whom were John Lyly and Thomas Nash. Public opinion would not allow harsh treatment of the Martinists, but when the heat of the controversy had died down, Henry Barrow and John Greenwood were arrested and hanged in 1593. See W. Pierce, *John Penry, 1559-93*, 1923; J. Davies, *Sir Martin Mar-People*, 1923; and W. Haller, *Rise of Puritanism*, 1938.

Marquand, John Phillips (*b.* 1893), Amer. novelist, *b.* in Wilmington, Delaware, U.S.A. Served with the artillery in the First World War. Chiefly known

for his satires of the upper classes of New England striving to retain their aristocratic Puritan pretensions in a modern world, as exemplified in *The Unspeakeable Gentleman* (1922) and *Wickford Point* (1930). For his *Late George Apley* (1937), a story satirising the life of a Boston Brahmin, he was awarded the Pulitzer prize (1938). Other novels: *Four of a Kind* (1923); *The Black Cargo* (1925); *Haven End* (1933); *No Hero* (1935); and *Thank You, Mr. Moto* (1936), with other detective stories fashioned on the character of Moto, a Jap. sleuth.

Marque, Letter of, see LETTER OF MARQUE.

Marquesas, or Marquezas, Isles are, properly speaking, the S. group of the Mendaña Archipelago, in Polynesia, the N. group bearing the name of the Washington Is.; but the name is now applied to the whole archipelago. The M. I., in lat. 7° 30' to 10° 30' S., long. 138° to 140° 20' W., were discovered by Mendaña de Neyra, a Sp. navigator, in 1595; the Washington Isles were discovered in 1791 by Ingraham, an Amer. Sev. of the is. were visited by Cook in 1774. The largest is. are Nuka-hiva (the seat of the Fr. commissioner) and Hiva-oa. The is. are of volcanic origin, and are mountainous, rising in some cases to over 3800 ft. above sea level; the soil is rich and fertile, and the climate hot, but healthy. Coco-nut, bread-fruit, bamboo, and papaw trees are grown, and bananas, yams, plantains, oranges, and sugar-cane are cultivated. The inhab. are degraded in their religion and in many of their customs. Cannibalism, once practised, is now suppressed. Resolution Bay, in Tahiti, and Port Jarvis, in Roapoia, are the best harbours in the is. In 1842 the M. I. submitted to the Fr., and now form a Fr. protectorate. Total area 480 sq. m. Pop 2988, having decreased from 100,000 during the last century. See R. P. Linton, *Archaeology of the Marquesas Islands*, 1925.

Marquetry (Fr. *marqueter*, to variegate, inlay), name of a kind of inlaid work similar to mosaic work, especially used for the decoration of furniture. It consists of veneering or inlaying plain white wood with costly woods of varied tints, or with other materials, such as tortoise-shell, ivory, metal, mother-of-pearl. Shaped pieces are so combined as to form beautiful designs. M. is a later development of intarsia; the pieces are affixed to a matrix by glue. The art was known from the earliest times to the Egyptians and Gks. and other E. peoples, and was introduced from Persia to Venice in the fourteenth century. The Dutch and Fr. *marqueteurs* (P. Cole, Vorst, Jean Macé, and A. C. Boule) are some of the most noted. Roentgen, Reisner, and Oesen were famous Ger. ebenistes of the eighteenth century. See Eliza Turek, *Practical Handbook to Marquetry*, 1899; F. H. Jackson, *Intarsia and Marquetry*, 1903; and P. A. Wells, *Veneering, Marquetry, and Intay*, 1904.

Marquette, co. seat of M. co., Michigan, U.S.A., on the S. shore of Lake Superior. Large quantities of iron ore are shipped from the docks, and the tn. manufs.

machinery and engines, and has iron foundries, lumber works, and fishing industry. Farming is carried on in the surrounding country. Pop. 15,900.

Marquis, Frederick James, see WOOLTON, BARON.

Marquis, or Marquess (at first an adjective, march count, O.F. *marchis*, from Romance *marca*, boundary). Originally in European countries this was the title of the rulers of certain frontier lands or marches (lords-marchers) of



E.N.A.

MARRAKESH

The mosque of Sidi-Bel Abbas.

Great Britain, margraves (*Markgrafen*) of the Continent). This foreign equivalent was very common on the Continent. Then it came merely to indicate a certain degree of the peerage in England, ranking below a duke and above a count or earl. Robert de Vere, ninth earl of Oxford, was the first M. in this sense, created 1385. He was created M. of Dublin by Richard II., to the great offence of the earls, who had to yield to him precedence. The marquise became firmly estab. under Henry VI. in 1442. It was adopted in the Scottish peerage in 1539, when the Ms. of Huntly and Hamilton were created. The marquise of Winchester, created by Edward VI., dates from 1551, and is the oldest in existence. The title is usually territorial in form, but may stand before a surname, the form 'marquess' now being used.

Marradi, Giovanni (1852-c. 1923), It. poet, b. at Leghorn. After leaving the univ. he became inspector of education for Massa-Carrara. His chief works are *Fantastie marine* (1881); *Nuovi Canti* (1891); *Ballade moderne* (1895); *Rapsodie Garibaldine* (1899-1904). An ed. of all his poetry was issued in 1904 under the title of *Poesie, noramente raccolte ed ordinate*. As a poet he is noted for his elegant style and his love of nature.

Marradi, tu. in the prov. of Florence, Italy, 30 m. N.E. of Florence. Pop. 12,100.

Marrakesh, or Morocco, old cap. of the Moorish Empire, on the N. side of the Great Atlas range, 90 m. from the Atlantic coast, and 250 m. S.W. of Fez; has manuf. of carpets and leather, and is the centre of the trade of S. Morocco. The city was founded in 1072, and had a pop. of 700,000 in the fourteenth century, which has now declined to about 190,000.

Marriage and Marriage Law. REQUIREMENTS OF A VALIDLY CELEBRATED MARRIAGE—The Religious Ceremony. In Rom. times consent was of the very essence of a valid M. and religious ceremony a merely accessory matter designed rather to bring the wife into the power of the husband and initiate her in the *sacra* of her new family. Later, mere dissent would suffice to dissolve the marriage state, with the inevitable result of a moral laxity that paved the way for Christian teaching. In England, prior to the decree of the Council of Trent in 1563, it was the general European law that a mere agreement to marry, supplemented by cohabitation, was enough to constitute M., and that no formal, secular or eccles. ceremony was necessary. The Church, however, through the eccles. courts, could compel the parties to such informal arrangement to celebrate and register the M. in due form. But the validity of these informal Ms. was directly destroyed after 1540 by an Act which provided that a subsequent *formal* M. with another person constituted a valid M.; and some twenty years later the decree of the council of Trent made a religious ceremony practically a *sine quan non* for all Catholic countries—decrees which after the Reformation had, of course, no civil force in Great Britain. It was only in 1753 that an Act was passed (Lord Hardwicke's Act) with the object of making a formal ceremony essential to an Eng. M. This Act was superseded by the Marriage Act of 1823, though the question of validity of informal as opposed to irregular Ms. (e.g. Ms. by 'Fleet parsons,' see below) was left open; and again, Informal Ms. are valid to this day in Scotland (see also HABIT AND REPUTATION). Since the decision of the House of Lords in the case of *Regina v. Miller* in 1843, it is generally agreed that all secular forms of M. other than those allowed by statute, e.g. Ms. before a registrar, are invalid. Jews and Quakers, however, enjoy certain privileges. The indirect effect of this legislation was to foster the action of breach of promise, for the power of the eccles. courts to compel parties to marry

who had contracted to do so informally was abolished. One extraordinary result follows from the sanctity of the religious ceremony; a girl of twelve and a boy of fourteen can be married by the Church of England, though they would be incapable of contracting civilly. See, however, below.

English Statutory Provisions.—The Marriage Act of 1823 covers the chief points of the law relative to M. in Great Britain. In the case where the parties contracting the M. reside in different parts, the banns of M. must be pub. in both parts. The law prescribes the audible pub. according to the rubric, after the second lesson, on three Sundays preceding the ceremony. If three months elapse between the time of pub., and the proposed date of the M., the banns become void, and the parties must obtain a licence or agree to a re-publication of banns. A M. may be performed in church on the authority of the superintendent registrar's certificate subject to the incumbent's consent. There are two kinds of M. licences: (1) The licence granted by the archbishop and bishops, through their surrogates, for M. in any church or chapel duly licensed for M.; (2) the special licence granted by the archbishop of Canterbury for M. at any ^{time} in any place on good reason being shown. The M. may be solemnised at any time between 8 a.m. and 6 p.m. and with open doors. It is a felony for any clergyman to conduct a M. where the banns have not been pub. or a licence obtained. The officiating clergyman must see to it that there are at least two witnesses present, and that the entries in the register-books are witnessed by two persons. M. with a deceased wife's sister was legalised in 1907 and M. with deceased brother's widow in 1921. By an Act of 1931 M. with various other persons (formerly within the prohibited degrees of relationship) was legalised as a civil contract; with the deceased wife's brother's (or sister's) daughter; with the father's (or mother's) deceased brother's widow; with the deceased wife's father's (or mother's) sister; and with the brother's (or sister's) deceased son's widow. The law with regard to the M. of infants is contained in the Guardianship of Infants Act, 1925, which provides that where both parents are alive the consent of each must be given; if one is deceased, the survivor must consent (and where a guardian has been appointed by the deceased, the survivor and the guardian must consent). By the Age of Marriage Act, 1929, M. under sixteen years of age is forbidden. M.s. may be conducted in a dist. register office or in a Nonconformist building registered for Ms. by certificate or by licence. Notice must be given personally to the superintendent registrar, a registrar of births and deaths, a registrar of Ms., or to the deputy registrar. A M. at a register office must take place in the presence of the registrar of Ms., and the superintendent registrar. If both parties reside in the same registration dist., the duration of such residence must have been at least seven days before the notice of M.

can be given. If the parties reside in different registration dists., notice by each must be given to a registration officer, such notice being valid only after a seven days' residence in one of the dists. In the case of M. by licence, one notice is necessary whether the parties live in the same or in different registration dists. Where both live in the same dist., one of them must have lived there for fifteen days before the notice can be accepted. If they live in different dists., notice may be given in either of the dists., provided the residential qualification has been fulfilled. Where this qualification has been fulfilled by one of the parties, the other must have been resident in England or Wales at the time of such notice. The Marriage Act, 1939, gives certain facilities in the case of one party residing in Scotland and the other in England; but the provisions as regards a M. in Scotland apply only to 'a regular M.' whereas no such distinction is necessary where the M. is to be solemnised in England. A certificate for M. (without licence) may be issued by the superintendent registrar after the lapse of twenty-one clear days from the date of entry of the notice in the notice-book, provided no impediment is shown. The M. may then take place within three calendar months from the date of entry of the notice. A certificate and licence for M. may be issued by the superintendent registrar, provided no impediment is shown, after the lapse of one week-day (Christmas Day and Good Friday excepted). The M. may then take place within three calendar months from the date of entry of the notice.

Foreign Marriages, or Marriages Abroad of British Subjects, and Marriages between Persons one at least of whom is not Domiciled in England.—The Foreign Marriage Act of 1892 provides that Brit. subjects may contract a valid M. in a foreign country provided they conform to the provisions of the Act. It is sufficient that one of the contracting parties be a Brit. subject. The M. officer must satisfy himself, where a M. according to local law is valid by Eng. law, that: (a) both parties are Brit. subjects; or (b) when only one is a Brit. subject the other is not a subject or citizen of the country; (c) When only one is a Brit. subject, and the other is a subject or citizen of the country, proper facilities do not exist for the solemnisation of the M. in the foreign country in accordance with the law of that country; or (d) when the man is a Brit. subject and the woman a subject or citizen of the country, no objection will be taken by the authorities of the country to the solemnisation of the M. under the Act. In the case of any M. under the Act, where the woman is a Brit. subject and the man a foreigner, the M. officer must be satisfied that: (a) the M. will be recognised by the law of the country to which the foreigner belongs; or (b) some other M. ceremony in addition to that under this Act has taken place, or is about to take place, between the parties, and that such other ceremony is recognised by the law of the country to which the foreigner belongs; or (c) the leave of

the secretary of state has been obtained. By the Marriage with Foreigners Act, 1906, notice of an intended foreign M. must be given by the Eng. party to a registrar in England, and a certificate showing that such notice has been given must be sent by the registrar to the M. officer. There is also provision in the Act for reciprocal action by foreign countries whose inhab. desire to marry in England.

Marriage in the U.S.A.—The law regulating M. is not uniform throughout the U.S.A. The question is left to the law-making bodies of each individual state. The marriageable age varies widely. With parental consent, the age for males ranges from fourteen to twenty-one and for females from twelve up to eighteen. Without the consent of parents, the age for males ranges from fourteen up to twenty-one, but in most states the latter age is required. Without consent of parents the age for females ranges from twelve to twenty-one, but in the majority eighteen is the age required. In some states a child can be disinherited by law for marrying below the legal age without parental consent. A M. licence of some kind is required in every state of the union, usually obtainable from the co. clerk's office. Throughout the U.S.A. M. is now on the civil contract basis, but religious ceremonies are authorised in all states, provided a M. licence has been obtained. In many states there is no delay in issuing the licence or in marrying as soon as the necessary papers have been secured. In New York state a M. certificate must be filed within seven days, and all under twenty-one who wish to marry must present a birth certificate or other proof of age. In a considerable number of states a delay of five days is required before a M. licence is issued. In the S. M. between whites and negroes is unlawful, and in sev. S. states there is a similar prohibition of M. between whites and Indians. Many states also require proof that both the man and the woman are free from venereal infection. Common law Ms. of a year's duration or more without either licence or ceremony are now validated by the courts in most states upon proper proof and particularly where children or property are involved. In most Amer. states weddings can be performed at any time and place that suits the contracting couple. The number of Ms. reported for the U.S.A. in 1929 was 1,232,559 or 10·10 per 1000 pop. In 1948 the total number was 2,286,000 or 16·3 per 1000 pop.

MARRIAGE CUSTOMS, ANCIENT AND MODERN: Britons.—Among the anct. Britons daughter was obliged to marry whomsoever her father selected for her husband. Courtship was of short duration, and the M. was celebrated at a cromlech in the open air, while sacrifices were offered.

Romans.—The oldest Rom. form of M. was called *confarreatio*, the name, and ceremony being derived from the time-honoured association of M. with the cultivation of corn. The confarreative form of M. was competent only to those patricians who had the privileges of the *jus*

sacrum, and hence patricians and plebeians could not at one time intermarry. The plebeians had no analogous ceremony, and the wife only fell under the power (*manus*) of the husband either by a process of fictitious sale called *cormplio*, or by implication from remaining with the husband for one year; but *confarreatio* necessarily involved marital power. The civil form of *usus* was not introduced out of grace to the plebeians, but rather for the express purpose of preserving the patriciate; for otherwise the *sacra* would have had to be extended to the plebeians. The union of mere slaves was called *contubernium*, and was never regarded as more than a promiscuous relationship. The peculiarity of these old Rom. forms of M. was that they did not in themselves constitute the tie; they merely decided the position of the wife so far as the question of subjection to her husband's power was concerned. The tie itself was apparently constituted by the mere consent given on both sides, and the nuptials or rites and ceremonies of initiation into the husband's *sacra* were looked upon as merely accessory to such facts as evidenced the consent, e.g. the reception into the husband's home. The bar against patricians intermarrying with plebeians was removed four years after the decemviral revolution, viz. by the Cornelian Law (444 B.C.). In A.D. 9, after the extension of citizenship by the celebrated *Lex Papia Poppaea*, Romans were permitted freely to intermarry with foreigners and freedmen. By the time of Justinian, M. was a purely mutual relationship subsisting only so long as the parties mutually consented to live with each other.

Greeks.—With the anct. Gks. the nuptial ceremony was a symbolic representation of the forcible carrying away of the bride, by way of allusion, it seems, to the Gk. tradition that a bridegroom should only be entitled to his bride by performing some heroicfeat or subtle stratagem; e.g. the mythical hero Theseus is famous for the traditional abduction of Helen, daughter of Leda. On the wedding day, the betrothed pair, having laved themselves in water drawn from some special fountain, went to the temple, followed by friends singing psalms of praise. Sacrifices were made at the altar, and the bride, at least if of the wealthier classes, was conducted to her new home in the evening in a chariot drawn by oxen or mules.

Egyptians.—In Egypt *nahr*, or dowry, is indispensable to union with a chosen female. The compact of M. is settled by the woman's *wakeel* (deputy). Among the upper classes the man has next to no chance of ever seeing the woman's face before M., and has perforce to satisfy himself with the description of her by professional *khadi'ehs* or women whose vocation is to give men information about eligible girls. The M. contract is witnessed by two Moslems, and all present recite the Fâ'theh or opening chapter of the Koran, the various phases of this ceremony being performed or controlled by a *fikee* (schoolmaster). Formerly there were a great many more tedious

customary steps before the M. was completed. The curious part about Egyptian Ms. was that it was only at the last moment that the bridegroom, having paid what is called the 'price of the uncovering of the face,' had a chance of satisfying himself on the question of his bride's personal appearance. If he was not satisfied he generally retained her for a week or more before divorcing her (see E. W. Lane, *Modern Egyptians*, 1836). M. is no bar to the right of having concubines, who are, however, inferior in status to the legal wife.

Chinese.—According to the Chinese, M. goes by destiny, from the fact that the Buddhist teaching is to the effect that those connected in a previous existence become united in this. Once Yuelanou, the deity of the moon, has united all pre-destined couples with a silken cord, nothing can prevent their ultimate M. Courtship and M. among the wealthy Chinese are matters settled exclusively by the parents, who fix the time of the nuptials and consult, therefore, the calendar for a propitious day. The solemnisation of M. is always preceded by three days' 'mourning,' during which time all the relatives abstain from every kind of amusement, the reason for this custom being that the Chinese regard the M. of their offspring as a presage of their own deaths. Chinese fathers may sell their daughters in M. to whom they please. A son dare not refuse the bride selected for him by his father any more than the daughter can, but it is only among the lower orders that purchase and sale are common.

French.—In France a prov. M. requires both a civil and religious ceremony for its completion, all the pomp and parade being reserved for the latter occasion. The civil M. is performed at the mayor's office before a registrar, who, having made the necessary entries, reads passages from the Code Napoléon relative to the law of M. Prior to the church ceremony the parties have to produce their tickets of recent confession.

Hebrew Customs.—According to scripture the custom of purchasing brides prevailed among the descendants of Abraham and undoubtedly the custom still exists in many parts of the E. The alternative for a poor man was to obtain a bride by servitude. Conformably with oriental custom espousals began at a very early age, and males at the age of eighteen and females at twelve were competent to marry. The bride's hair was always disposed in ringlets, and so has been frequently compared to that of goats on Mt. Gil-ead. The ceremony itself was performed, as a rule, at the house of the bride's father, and usually, the latter acted as the 'celebrator,' if not, the rabbi or *hezen* of the synagogue performed the duties of that office, which consisted in covering the head of the bride with the extremity of the bridegroom's *thelot* and consecrating a cup of wine. After the ceremony there was usually a procession with dancing and music by torchlight to the groom's house, the pair walking

or being borne along under a canopy. Modern Jewish weddings are, or were till recently, remarkable for the curious custom of 'sitting for joy,' by which is meant that the bridegroom, after visiting the synagogue for the 'reading of the Law,' sits in his bride's home and for the whole day receives congratulations.

Scottish Customs: Gretna Green Marriages.—Gretna Green is celebrated in hist. as having been the first convenient halting-place for fugitive couples from England. The rule of law being that a M. was valid if contracted according to the law of the place where the parties enter into the contract, the couple being in Scotland had but to make a mutual declaration of M. before a witness—the work of a moment—and such ceremony obviated all difficulties of age, consent of parents or guardians, banns, and so forth. (see R. Elliott, *The Gretna Green Memoirs*, 1842.) The efficacy of Gretna Green Ms. was destroyed by the provision in the Marriage Act, 1856, which requires residence for three weeks in Scotland of at least one of the parties (see also GRETNA GREEN). 'Handfasting' was an old customary form of M., which for long prevailed in Eskdale and neighbourhood. According to Sir John Sinclair's *Statistical Account of Scotland* (1794), couples chose each other at some time-honoured fair, and, after a year of cohabitation, they continued together for life if such probationary period proved mutually satisfactory. If not, they separated, and the disaffected one was saddled with the issue. If each was disaffected it seems the husband had the issue. Later, such Ms. were looked upon as perfect only when subsequently confirmed by a priest. Betrothal by hands clasped across a brook in which the pair had been previously washed has a more spiritual flavour about it, and is celebrated as the ceremony that took place between Burns and 'Highland Mary.' In many rural dists. the name of 'penny weddings' was popularly given to those weddings which were char't'ed by the observance of the anc't. custom of levying a penny (equivalent to a modern shilling) from all who were going to be present at the celebrations. It seems that during the seventeenth century these weddings degenerated into scenes of disorder, and in 1645 they were condemned by the General Assembly. See C. Rogers, *Scotland, Social and Domestic*, 1869.

Welsh Customs.—The old custom of giving 'bidding letters' intimating an intended M., its date, and the intent of the parties to make a bidding at some inn to ask for the pleasure of the company and support of the parties to whom the letters were sent, was formerly almost universal. There was also an old Brit. custom called 'purse and girdle,' by which the bride's goods, comprising generally an oak chest and feather bed, were taken on the day before the M. to the bridegroom's house, while the groom in the evening received his friends' gifts. Cardigan weddings were often characterised by a procession of friends headed by a harper or fiddler.

Fleet Marriages.—These were clandestine Ms., that generally took place at the Fleet prison without pub. of banns by real or pretended clergymen, known to posterity and the readers of Tom Brown's works as Fleet parsons. The first recorded M. at the Fleet is that mentioned in a letter from Alderman Lowe to Lady Hickes in 1613, wherein the writer states that a mutual acquaintance of theirs, one George Lester, having on the previous day in the 'Fleet' 'marryed' the wealthy mother-in-law of one Thoinas Fanshawe, would be able to 'lyve and mayntayn himself in prison.' Formerly these Ms. took place at Duke's Place and Holy Trinity, Minories, until checked by the State, after which they were continued in unabated vigour at or in the vicinity of the Fleet by parsons, real or bogus, who were generally prisoners in the Fleet with neither money nor credit to lose by any proceedings which the bishop might see fit to institute against them. The last of the Fleet weddings was in 1754 when, after years of abortive legislation, Hardwicke's Marriage Act of 1754 came into operation.

See W. Tegg, *The Knot Tied*, 1877; S. C. Banerjee, *Hindu Law of Marriage and Stridhana* (5th ed. of Sir Gurudas Vandyopadhyaya's book first pub. 1879); J. Ashton, *The Fleet: its River, Prison, and Marriages*, 1888; H. N. Hutchinson, *Marriage Customs of Many Lands*, 1897; G. E. Howard, *History of Matrimonial Institutions*, 1904; O. Burdett, *The Idea of Coventry Patmore*, 1921; P. E. Corbett, *The Roman Law of Marriage*, 1930; C. Mullins, *Wife v. Husband in the Courts*, 1935; R. E. Baber, *Marriage and the Family*, 1939; and Margaret Cole, *Marriage Past and Present*, 1939. See also the works of E. A. Westermarck (q.v.), including *History of Human Marriage* (3rd ed.), 1901.

Marriages, Registration of, see REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES.

Marrickville, tn. in Cumberland co., New S. Wales, 3½ m. S.W. of Sydney. Pop. 22,000.

Married Women's Property, see HUSBAND AND WIFE.

Marriott, Sir John Arthur Ransome (1859–1945), Eng. historian. He was educated at Repton and New College, Oxford, where he was a lecturer. As secretary of the univ. extension delegacy he showed administrative ability and no mean powers as a lecturer to large audiences. In 1914 he was elected to a fellowship at Worcester College, where he was already lecturer in modern hist. He sat as Conservative M.P. for Oxford City from 1917 to 1922, and for York, 1923–28. Known widely as a historian of modern times, and as a writer on constitutional and imperial subjects, modern diplomacy in relation to the E. question (q.v.), European hist. from Waterloo to the Versailles Treaty of 1920, and the growth of the Brit. Empire were his main chosen fields. He wrote also on economics and finance. His later works include *The Eastern Question* (1917); *Economics and Ethics* (1923); *A History of Europe from 1815 to 1923* (1931); *The English in India* (1932);

Oxford: its Place in National History (1933); *Commonwealth or Anarchy* (1937); *The Evolution of the British Empire* (1939); *English History in English Fiction* (1940); *A Short History of France* (1942); *Federalism and the Problem of the Small State* (1943); *Anglo-Russian Relations* (1944); and *Memoirs of Fourscore Years* (pub. 1948).

Marrow, fatty substance filling the central cavities of tubular bones and the interstices of cancellous or spongy bone. It consists of fat cells, red corpuscles fully developed and some in process of formation, and giant cells called myeloplaques. There are two kinds of M.: red M., which is associated with the early life of animals, and yellow M., which fills the tubular bones in later life. The function of the M. is the formation of red corpuscles, and in certain forms of anaemia the diseased condition is probably due to a disturbance of this function. In some such cases the M. has been found to have undergone great changes, and to tend to revert to its embryonic condition. M. has been employed in the treatment of pernicious anaemia.

The vegetable M. is a kind of gourd (q.v.).

Marrow Controversy. In 1718 an old Eng. puritanic book called *The Marrow of Modern Divinity*, first pub. in 1646, was republished by some Scottish divines, including Thomas Boston of Ettrick in Selkirk. Its extreme Calvinism caused the General Assembly to condemn it as antinomian in 1720. This caused a great religious struggle in Scotland, at its fiercest from 1718 to 1722. This controversy eventually led the General Assembly to depose the Rev. Ebenezer Erskine, and three others. They anticipated this decision by seceding and forming an 'Associate Presbytery' in 1733. Differences among the seceders themselves eventually led to the formation of 'burghers' and 'antiburghers.'

Marrucinian Dialect, see under LATIN LANGUAGE AND LITERATURE.

Marryat, Frederick (1792–1848), Eng. sailor and novelist, b. at Westminster, and second son of Joseph M., who was at one time M.P. for Sandwich. He received a private education and joined the *Impéresse*, under Lord Cochrane, in 1806. He formed a lasting friendship with Sir Charles Napier and Houston Stewart. In 1812 he was promoted to the rank of lieutenant. He married, in 1819, Catherine, second daughter of Sir Stephen Shairp, of Houston, Linlithgow. He took command of the *Beaver* sloop in 1820, and was employed on the St. Helena station until the death of Napoleon. Serving in the Burma war of 1824 it was on his suggestion that the *Diana* was used, the first employment of a steamship on active service. He succeeded to sev. other appointments, but finally gave up the sea after being nominated C.B. in 1830. He was elected a fellow of the Royal Society in 1819, through adapting Sir Hume Popham's system of signalling to a code for the mercantile marine. In 1833 the king of France decorated him with the Legion of Honour.

After his retirement from the navy he gave himself up to novel writing. Included in his works are *The Naval Officer, or Scenes and Adventures in the Life of Frank Mildmay* (1829); *Peter Simple* (1834); *Mr. Midshipman Easy* (1836); *The Phantom Ship* (1839); *Masterman Ready* (1841); *Percival Keene* (1842); *The Settlers in Canada* (1844); and *The Children of the New Forest* (1847). He wrote a pamphlet, *Suggestions for the Abolition of the Present System of Impressionment in the Naval Service* (1822), which created a profound impression in naval circles at the time. He pub. sev. caricatures of a political and social nature. His stories, taken from personal experience, are full of life, humour, and stirring narrative. See *Life and Letters of Captain Marryat* by his daughter, Florence (herself a novelist), 1872; and also a life by D. Hannay, 1889. See also M. McGrath, *A Century of Marryat*, 1929; and C. Lloyd, *Captain Marryat and the Old Navy*, 1939.

Mars, Mlle (Anne Françoise Hippolyte Boutet-Monvel) (1779–1847), Fr. actress, the favourite actress of Napoleon I., especially distinguished in comedy. She joined the Comédie Française (1799), her first great success being in *L'abbé de l'Épée*, 1803. In the plays of Molière, Marivaux, Scialo, and Beaumarchais she was unrivalled, and she created parts in many less known plays. Mlle M. retired in 1841, appearing as Célimène in *Le Misanthrope* and Aramantine in *Les Femmes savantes* for her 'benefit'. She made great reforms in stage costume. Her *Mémoires* and *Confidences* (pub. by R. de Beauvoir, 1849, 1853) are of doubtful value.

Mars, Mavors, Marmar, or Mammers, in Rom. mythology the god of war (Gradivus), early identified with the Gk. Ares. As patron of agriculture he was known as Silvanus, and as protector of the Rom. state was worshipped as Quirinus. He was held next in importance to Jupiter, and never entirely lost his essentially It. character. See W. H. Roscher, *Ipollo und Mars*, 1873; W. Warde Fowler, *Roman Festivals*, 1908; and G. Wissowa, *Religion und Kultus der Römer*, 1912.

Mars, whose orbit lies between those of the earth and Jupiter, and which is therefore the fourth planet from the sun, has been known from very early times. When nearest to the earth (about 35,000,000 m.) M., which shines with a reddish light, has more than twice the brightness of the brightest star, viz. Sirius, the dog-star. The mean distance of M. from the sun is 141,500,000 m., or about one and a half times that of the earth from the sun, and its diameter is 4230 m. or about half that of the earth. As a wealth of detail is visible on the surface of M., its period of rotation has been calculated to a nicely, being slightly more than that of the earth, viz. 24 hrs. 37 min. 23 secs.

M. is possessed of two very small satellites, whose diameters cannot be more than 7 m. Both satellites are very near to M., the nearer, Phobos, being only 5800 m., the outer, Deimos, being 14,600 m. from the centre of M. These minute

bodies were observed by Asaph Hall with the large refractor of Washington observatory in 1877. So Dean Swift, when he made Mr. Lemuel Gulliver relate that the astronomers of Laputa had discovered two Martian satellites, was merely shooting an arrow at a venture, but it happened to hit the target. One of the most interesting of scientific speculations is as to whether life is possible on M., and much has been written on this subject. The arguments in favour of life are the 'canals,' or sharp thin lines on the planet's surface, which would appear to be the product of intelligence, and the seasonal waxing and waning of the white polar caps, which may be of snow, thereby indicating the presence of water, a prime necessary of life; they may, however, be of carbon dioxide, which does not imply water. On the other hand it is suggested that the 'canals' are merely the interpretation given by certain observers to natural features on the planet. In addition the spectroscope shows that the Martian atmosphere must be of extreme rarity. Recent work by Dr. G. P. Kuiper has estab. the presence of carbon dioxide in the atmosphere, in quantity equal to that in the earth's atmosphere; ammonia and methane would seem to be absent. He supports the theory that the polar caps are of water-vapour and ordinary snow. Also there are seasonal green patches, the nature of which may be determined by infra-red spectrograph. See P. Lowell, *Mars and its Canals*, 1906; and *Mars as the Abode of Life*, 1908; G. H. Hamilton, *Mars at its Nearest*, 1926; R. T. Gould, *Canals*, 1929; H. Spencer Jones, *Worlds without End*, 1935, and *Life in Other Worlds*, 1940; and F. Whipple, *Earth, Moon, and Planets*, 1941.

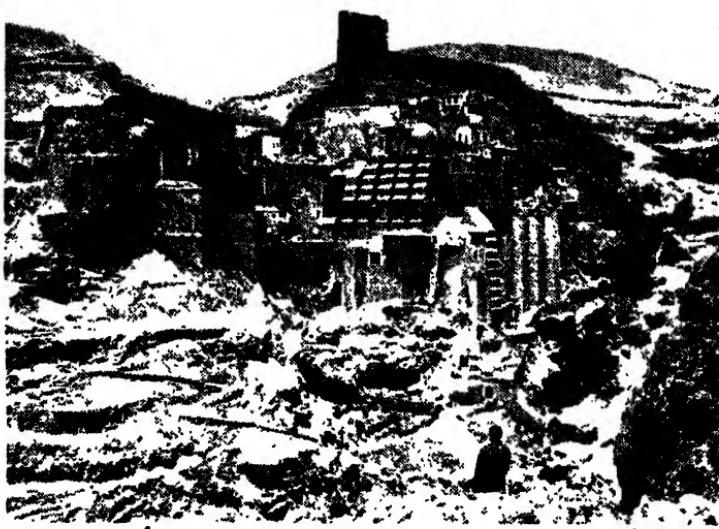
Mar Saba, deep canyon on the E. side of the plateau of Judea, Palestine, where it abruptly slopes to the Lower Jordan and the Dead Sea. The Arabs use the natural caves in the *wadis* for camps for their families. Between Bethlehem and the Dead sea at the head of the canyon lies the orthodox monastery of St. Sabbas (or Mar Saba), an anti. settlement of ascetics estab. in the fifth century. Ladies are not admitted to the monastery, which stands precipitously on the side of the canyon, but are able to overlook it from a medieval tower outside the porch. About forty-five monks inhabit the monastery, where they lead lives of great austerity. (See illustration, p. 38.)

Marsala, fortified seaport of Trapani prov., W. Sicily, 58 m. W.S.W. of Palermo. It is on the site of Lilybeum, the chief Carthaginian stronghold in Sicily, which long resisted siege by Pyrrhus and the Romans, but eventually surrendered in 241 B.C. It has a cathedral, a vibrating bell-tower, and a noted grotto and well. There is a trade in wines, grain, and oil, wine and brandy being the chief exports. It has salt mines and white marble caves near. Garibaldi and his patriots landed here (1860). In the invasion of Sicily in 1943 the churches of S. Girolamo, del Collegio, Madonna della Cava, and S. Salvatore were destroyed and some damage was sustained by those of S.

Antonio di Padova, del Carmine, S. Giuseppe, and others; and the civic museum was almost completely destroyed, the Flem. triptych of the Adoration being lost under the debris. Pop. 60,200.

Marsala, name of various wines manufactured at M. by building up and strengthening the wines of Sicily, especially of a light-coloured wine resembling sherry. It contains 20 to 25 per cent of alcohol. M. wine is often sold as Madeira, port, etc.

as *Le Chant de guerre pour l'armée du Rhin*. It was an instant success and became known far and wide before it appeared in print on July 7, 1792, in *Affiches de Strasbourg* (or *Strasburgisches Wochenschatz*). It was sung by the volunteers of Marseilles (hence its present name) as they entered Paris (July), and at the storming of the Tuileries (Aug.). Forbidden under the Restoration and the second empire, it again became the national song during the Franco-Ger. war. See A. Rouget de



D. McLeish

THE TERRACED MONASTERY OF MAR SABA, NEAR THE DEAD SEA

It was founded in the fifth century by St. Sabbas. Its wealth during succeeding centuries caused it to be repeatedly plundered and it became necessary to fortify it.

Marsden, William (1751-1836), Eng. orientalist and numismatist, went to Sumatra (1771) in the service of the E. India Company, and estab. an E. India agency at Gower Street, London (1785). He was secretary to the Admiralty (c. 1795-1804). His works include *History of Sumatra* (1783); *Dictionary and Grammar of the Malayan Language* (1812); a trans. of Marco Polo (1817); *Nunismata illustrata Orientalia* (1823-25). He presented his coin collection to the Brit. Museum (1834), and his library of oriental books and MSS. to King's College, London.

Marsden, small tn. in the W. Riding of Yorkshire, England, in the Colne Valley, 7 m. W.S.W. of Huddersfield. It has silk, cotton, and woollen factories. Two reservoirs of the Huddersfield water supply are at M., and a canal tunnel is in the neighbourhood. Pop. 7000.

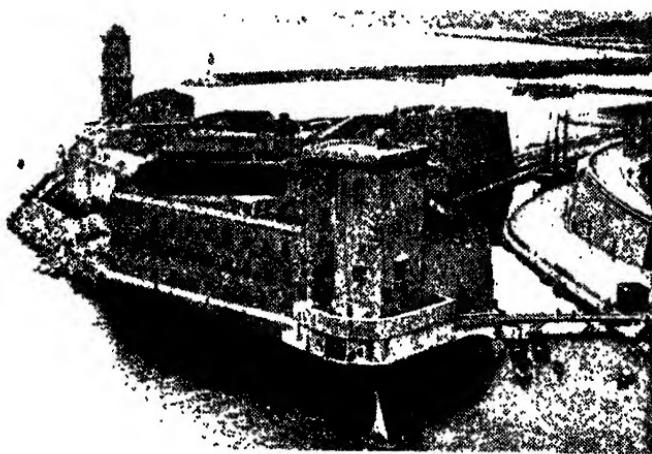
Marseillaise, stirring Fr. national anthem, composed by Rouget de Lisle (1792)

Lisle, *La Vérité sur la paternité de la Marseillaise*, 1865; A. Loquin, *Les Mélodies populaires de la France*, 1879; monographs of F. N. Le Roy de Sainte-Croix, 1840; A. Loth, 1886; and H. Wendel, 1936.

Marseilles (Fr. *Marseille*), first seaport of France and of the Mediterranean, and cap. of the dept. of Bouches-du-Rhône, is situated on the gulf of Lions, 410 m. in a direct line S.S.E. of Paris. M. is a military place of the fourth class, and is defended by a citadel and other works; the roads are protected by the fortified isles of If (crowned by a castle, once a state prison), Pomègue, and Ratonneau. Its harbour is formed by an inlet of the sea running eastward into the heart of the city and has great natural and artificial advantages. Immediately N. of the harbour is the old tn., with narrow streets, lined with high, closely piled houses. It contains the cathedral, a structure originally built out of the ruins of a heathen

temple in the fourth century. Westward from the old tn., and connected with it by a beautiful street, Le Cours, is situated the modern tn., elegantly built and laid out. Here the shops and houses rival in splendour the finest in Paris. Other fine streets are the Cours Bonaparte and the Promenade de Tourette. The site of the city is a valley surrounded by hills, the highest of which is Notre-Dame de la Garde. M. has schools of hydrography, medicine, drawing, and music; five hospitals, an

with the whole of Provence, to France in the reign of Charles VIII. In 1720, when it had again risen to great importance, it was ravaged by a fearful epidemic, and 40,000 of its inhabs. swept away. In the Second World War M. was occupied by the Gers. from 1940 to 1944. It fell to the Fr. maquis supported by Franco-Amer. invading forces on Aug. 23, 1944. It required another five days after the Allies entered M. to eliminate knots of resistance in the city, but, meanwhile, the



D. M. Leish

MARSEILLES
The Grasse Tilly Fort.

observatory, various learned societies, a fine public library, a cabinet of natural hist., botanical gardens, and a picture gallery. Shipbuilding and the allied employments of a seaport are carried on. Many million tons of shipping are entered and cleared annually, and there is extensive trade in grain, coal, soap, oil seed, and petroleum. During a portion of the year the climate of M. is delightful, but in summer and autumn the heat is often intense.

M. was founded by a Gk. colony from Phocaea, in Asia Minor, about 600 years B.C. Its ant. name was Massalia, written by the Romans. *Massilia*. It was an important member of the ant. Gk. community, planted numerous colonies along the N. Mediterranean shores, and introduced the germs of Gk. civilisation into Gaul. In the eighth century it was destroyed by the Arabs and the maritime republics of Italy inherited the commerce of the Mediterranean, which formerly had been centred in M. It was united,

sweep N. of the city of the Amer. Seventh Army carried the invaders swiftly to the Rhône. Pop. 636,260.

The Harbour of Marseilles.—Up to the middle of the nineteenth century the port had only one dock, the Lacydon or Vieux-Port, whose first quays had been constructed in the sixteenth century and then enlarged at some time before being reconstructed in the nineteenth century. The great expansion in the nineteenth century came with the development of steam navigation, and development during the closing years of that century and the first decades of the next was so active that before the outbreak of war in 1939 the port installations comprised from N. to S., eight large docks: Vieux-Port, Joliette, Lazaret, Arene, Gare maritime, National, Pinède and Président Wilson. There are also two docks of lesser importance, including a graving dock, which are not used commercially but managed by the M. Dock Company, whereas most of the other docks are run by the M. chamber of

commerce. Access to these various docks is easy, except in a violent N.W. wind, when ships can anchor in the lee of the Frioul Is. or in the roadsteads of Endoume or Estaque. A breakwater nearly 10 km. in length, parallel with the coast, shelters the port installations on the seaward side. The length of quayage is 26,337 metres, of which 18,479 metres are accessible to ships. Before 1939 the port had 270 cranes with a lifting capacity of 1 to 10 tons, 40 floating cranes and pontoons, a 'Goliath' floating crane with a lifting capacity of 150 tons, 70 tugs, and 600 lighters. The scale of these installations made M. the busiest port in France (the figures for 1938 were: M., 9,793,000 tons; Rouen, 7,702,000; Le Havre, 6,667,000; and Bordeaux, 4,115,000). Before the war the total net tonnage of ships entered and departed from M. was 32,558,666 and the tonnage of merchandise was 9,792,563. During the Second World War most of the installations, previously hit by aerial bombardment, were destroyed systematically by the Germans before their retreat and by Aug., 1944, the greater part of the quays had been destroyed by 2000 mines, while 173 ships had been sunk in the harbour. Yet by the beginning of 1947 reconstruction had proceeded so well that the appearance of the port had been entirely changed. Over 5000 metres of quayage had been restored to use and by the first day of the year the port had in use 60 cranes, 10 lighters, 107 tenders, and 21 tugs, etc. The tonnage of ships entered and cleared, which in 1945 was 3,211,000, had risen to 12,000,000 in 1946, while the number of ships using the port rose from 1536 to 5332. The distribution of trade had, however, changed considerably; thus Britain had yielded the first place, which she occupied in 1938, to the U.S.A., only 103 Brit. ships entering M. in 1946 as compared with 928 in 1938, while Amer. ships increased from 91 in 1938 to 386 in 1946; Norwegian increased from 142 to 210; and It. fell from 645 to 28. The construction, now in hand, of a new dock (the Mirabeau) of vast dimensions in the northward prolongation of the harbour, will enable it to meet all developments of traffic while rendering the port more easily accessible to ships of the largest size. The new dock will be encircled by two great wharves, the one constituted by a mole 1000 metres long by 275 metres wide, dividing the present N. outer harbour in two; the other, still larger, running from the Rhône canal between Maurepiane and Cape Janet. The construction of this dock will increase the total quayage by 4000 metres. Two new graving docks of 250 and 300 metres will provide facilities for repairing the largest ships.

In 1948 a block of flats was commenced in M. to the design of Le Corbusier (g.v.). Called by its creator a 'vertical community,' it will house 1600 people in 330 separate flats.

See H. Brennier, *Le Port de Marseille*, 1927, and M. Clerc, *Massalia: Histoire de Marseille dans l'antiquité*, 1927-29.

Marsh (later Marsh-Caldwell), Mrs. *Mme Anne Caldwell* (1791-1874), Eng. novelist.

Among her most popular books are *Two Old Men's Tales* (1834); *Tales of the Woods and Fields* (1836); *Emilia Wyndham* (1846); *Norman's Bridge* (1847); *Havenscliffe* (1851); *Margaret and her Bridesmaids* (1856) and *Lords and Ladies* (1866); many of them pub. anonymously. She inherited the Lindley Wood property, Staffordshire, in 1858.

Marsh, George Perkins (1801-82), Amer. philologist, b. at Woodstock, Vermont. He was elected to the Supreme Executive Council of the State in 1835, and to Congress in 1842 and 1849. He was then U.S. minister resident at Constantinople, and in 1852 went on a special mission to Greece. Between 1857 and 1859 he was railroad commissioner for Vermont; and from 1861 until his death was the first U.S. minister to Italy. His most important works are *Grammar of the Icelandic Language* (1838); *The Camel* (1856); *The Origin and History of the English Language* (1862); and *The Earth as Modified by Human Action* (1874).

Marsh, Othniel Charles (1831-99), Amer. paleontologist, b. at Luckport, New York, prof. at Yale (1866), noted for his discoveries of many new species of extinct vertebrates, largely from the Rocky Mts. His chief works are *Odontornithes: a Monograph on the Extinct Toothed Birds of North America* (1880); *Dinocerata: a Monograph on an Extinct Order of Gigantic Mammals* (1884); *Sauropoda* (1888); and *The Dinosaurs of North America* (1896).

Marshal, William, first Earl of Pembroke and Striguil, of the Marshal line (c. 1146-1219), Eng. nobleman and soldier, trusted knight of Henry II., and tutor to his son, Prince Henry. After 1187 he fought in the Fr. campaigns. He became marshal of England under Richard I., on the death of his brother John (1194). On Richard's death M. supported John's claim to the throne (1199), and held office under him. On John's death (1216) he became regent of England for Henry III. during his minority. See *Histoire de Guillaume le Marchal*, c. 1225, a long Fr. poem discovered by P. Meyer in the Phillips Library.

Marshal (Fr. *maréchal*, from Low Lat. *marisculus*, a farrier), word which originally meant a man who took care of horses. The importance of the persons appointed to take charge of the royal horses gradually increased, until the word M. signified one of the highest officers of the court. The word now in England usually means the officer who regulates questions of precedence, etc., at official functions. In U.S.A. a M. is an executive or administrative officer for the U.S. Supreme Court, appointed by the president. With various additions M. represents various ranks, etc., as in field-M., M. of France, air M., M. of the hall, etc. See also FIELD-MARSHAL.

Marshall, Alfred (1842-1924), Eng. political economist, b. July 26 in London, was educated at Merchant Taylors' School and St. John's College, Oxford. Lecturer in moral science at Cambridge, 1865, and prof. of political economy there 1885-1908, he became principal of Univ. College,

Bristol, 1877, and in 1883 fellow and lecturer at Balliol College, Oxford. He was prof. of political economy at Cambridge, 1885-1908, and a member of the royal commission on Labour, 1891. His publs. include *Economics of Industry* (1879, with his wife); *Principles of Economics* (1890-91); *The New Cambridge Curriculum in Economics* (1903); *Industry and Trade* (1919); *Money, Credit, and Commerce* (1923). See A. C. Pigou (editor), *Memorials of Arthur Marshall*, 1925.



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GEORGE C. MARSHALL

Marshall, George Catlett (b. 1880), Amer. soldier and statesman, b. at Uniontown, Pennsylvania, son of a Kentucky coal merchant, rose from private to be the head of the Amer. Army. Unable on account of his father's Democratic leanings to get the necessary political recommendation to W. Point, he went to Virginia Military Institute for a soldier's education. Commissioned second lieutenant in the regular army he went to the Philippines during the insurrection of 1896. During that war he drew up a field order which was considered the best plan for the defence of Manila. After this revolt he helped to settle the Is.'s internal affairs. He entered the First World War as a captain, and was, in France, temporarily promoted to a colonelcy. He was an instructor at the staff school, at Leavenworth, Kansas. A brilliant student of tactical problems and a soldier of great administrative skill, his work as an operations officer for America's 1st Div. during the Fr. attack at Cantigny in May 1918, won him the Croix de Guerre. Later,

as operations chief to the First Army in France, before the Meuse-Arronche offensive, he moved nearly 500,000 troops and 2700 guns up to the front in under a fortnight. He helped to refashion the Amer. Army after the war from horse-gun fixed-front tactical theories to the modern mechanised type. Moving unspectacularly as an instructor from Washington to China, to Georgia, to Illinois and back to Washington, he did not become a brigadier until 1936, and was promoted a general on the day that the Gers. invaded Poland, when he was promoted by President Roosevelt over the heads of thirty seniors to be chief of the U.S. Army general staff. M. took a standing army of 200,000 and converted it into the vast and mobile machine of the Second World War. He served for some time in China, where he endeavoured, unsuccessfully, to mediate between the National gov. forces under Chiang Kai-shek, and the Communists. (See further under CHINA, History.) He succeeded Mr. Byrnes as secretary of state to the U.S. Gov. in Jan., 1947, and produced the 'Marshall Plan' for the financial and economic rehabilitation of war-shattered Europe. See ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. See K. T. Marshall, *Together*, 1947.

Marshall, John (1755-1835), Amer. jurist, of Eng. descent. With George Washington and James Madison he was a powerful factor in bringing Virginia to adopt the U.S. constitution. President John Adams appointed him to his Cabinet as secretary of state and, in 1801, chief justice of the supreme court, a position he held for thirty-four years. M. was probably the greatest judge the U.S.A. has produced. It was his decisions which gave the U.S. Supreme Court the great power it now possesses, for it was M. who decided that the court had power to pass judgment on the validity of national and state law. In fact, M. was responsible for the whole trend of judicial decisions calling upon the powers inherent in the Federal constitution. M. wrote a *Life of George Washington* (1804-7). See lives by A. B. Mugruder, 1885; J. F. Dillon, 1903; H. Flinders, 1905; A. J. Beveridge, 1916-19; and Lord Craigmyle, 1933. See also R. W. Griswold, *Prose Writers of America*, 1847; J. P. Collon's ed. of his *Constitutional Decisions*, 1905; and A. Johnson and E. S. Corvin, *The Age of Jefferson and Marshall*, 1921.

Marshall, cap. of Harrison co., E. Texas, U.S.A., 40 m. from Shreveport, Louisiana. It has locomotive shops and foundries, and railroad shops. Pop. 18,400.

Marshall Hall, Sir Edward (1858-1927), Eng. lawyer. Called to the Bar at the Inner Temple, 1888, he practised in London and on the S.W. circuit. He was Conservative M.P. for the Southport Div. of Lancashire, 1900-6, and for E. Toxteth div. of Liverpool, 1910-16. As a criminal advocate, especially for the defence in murder trials, he was without a rival. Among the most notable of his forensic triumphs were the Wood, the Peasenhall, the Greenwood, the Seddon, and the Thompson-Bywater cases, all murder

trials. See life by E. Marjoribanks, 1929.

Marshalling, in equity (q.v.) means such an arrangement of the assets of a deceased person as will secure their fair distribution to the various persons entitled to share in them. There are two prin. applications of the term: (1) M. as between creditors. Equity compels specialty creditors (i.e. those whose debts are evidenced by a deed) to resort primarily to the real assets (i.e. land), in order that the personality (property other than freehold or copyhold land) may be left as unexhausted as possible for the simple contract creditors (see CONTRACT); and generally where two persons, X and Y, are creditors of the same debtor, and X has two funds, A and B, of the debtor to resort to, while Y is limited to A, Y will be permitted to stand in X's place as regards payment of his debt out of B, if X has resorted to fund A (M. of securities, or M. as between secured creditors). But where the different funds belong to different persons, M. is not allowed to the prejudice of third persons. The doctrine of M. of securities is of especial importance in regard to second mortgages by a person of two (or more) of his estates, the equitable principle being that in such cases the first mortgage will be apportioned between the two properties according to their respective values. (2) M. as between beneficiaries entitled under a will, where creditors have depleted the estate. The general principle herein is that if any beneficiary in the subjoined list is disappointed of his benefit under the will through a creditor seizing upon the fund or property intended for such beneficiary, he may compensate himself by going against the fund or funds of those coming immediately after him in the list, who in their turn may do likewise, with the result that those who come last may get nothing at all. The order is as follows: (1) Widow; (2) specific and residuary devises and specific legatees; (3) pecuniary legatees; (4) charged devises (specific and residuary); (5) heir-at-law (q.v.); (6) devisees upon trust; (7) next of kin or residuary legatees.

Marshall Islands, group of coral formation in Micronesia, Pacific Ocean, N.E. of the Ladrone Is., Polynesia. There are two groups, Ratak (E.), and Ralik (W.), both ranging S.E. to N.W. The whole archipelago is composed of some thirty-three atolls, 158 sq. m. in area. They were annexed to Germany (about 1885), and administered by the Jaluit Company of Hamburg till 1906. The administration was then taken over by the Ger. colonial authorities, forming a dist. under the New Guinea Gov. They were captured by Japan in Sept. 1914, and administered under the mandate of the League of Nations. Copra and phosphate are exported. The Micronesian inhab. are skilled navigators. Pop. 10,500, and a few Europeans.

In the Pacific, campaigns of the Second World War the Amer. made diversionary air attacks on the M., beginning in mid-Nov., 1943. This bombing attack continued for two months at long range, with

daily raids throughout Jan. 1944. Then Amer. forces invaded Kwajalein Is., in the heart of the M., the attack being opened by a very strong force, which stood off-shore for two days, pouring shells into the defences. The landing was effected on Jan. 31, and by Feb. 4 the Jap. resistance was overcome. The remaining Jap. bases in the M. were then isolated, and eventually all taken. After their capture the Is. were administered by the Amer. Navy, with an interim civil gov. On July 19, 1947, the U.S. formally took over the rule of the former mandated Is. in the Pacific under United Nation's trusteeship, and a permanent civilian staff was then estab.

Marshall Plan, see EUROPE, History; ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION.

Marshalltown, co. seat of Marshall co., Iowa, U.S.A., near the Iowa R., 48 m. N.E. of Des Moines, the centre of a fine agric. region. It has an important distributing trade and manufs. machinery, car accessories, and furnaces. It has packing estabs., and manufs. of furniture, engines, etc. Farming and stock-raising are carried on. Pop. 19,200.

Marshalsea, prison formerly existing in Southwark, London, used latterly for debtors, and abolished in 1849. It was connected with the M. Court, held by the steward and marshal of the king's household. It was united with the Queen's Bench and the Fleet (1842). See C. Dickens, *Little Dorrit*, 1855-57.

Marshfield, banking city of Wood co., Wisconsin, U.S.A., 180 m. N.W. of Milwaukee. It has trade in lumber and manufs. of wood-veneer, springs, nut-tresses, etc. Pop. 9000.

Marsh Frog, *Rana ridibunda*, either a variety of the edible frog, *Rana esculenta* or a separate species. Although scientific opinion has recently held the latter view, it seems doubtful whether the opinion of Bouleenger given in 1897 that it is not a separate species will not eventually prevail. The frog is also called the Hungarian frog, but M. F. is its popular name—not unsuitable, seeing that the frog is firmly estab. on Romney Marsh in Kent. The M. F. is said to have been first introduced to Romney in 1935, and there are now probably tens of thousands over the area from Hythe to Rye, and around Tenterden. The ground colour of the M. F. is like weathered cement and, in pattern, the most observable peculiarity is a series of square dark brown spots on the legs which remain through all colour changes. When basking in the sun on a bank it assumes a striking grass-green hue. In size the M. F. much exceeds all other Brit. frogs or toads. In general, the M. F., like the edible frog, is very aquatic, and never seems to be more than a distance of one leap from the water. A six-foot leap is not beyond the powers of a full-grown specimen. Despite the scientific name, it is difficult to detect anything resembling laughter in its croaking.

Marsh Gas, see METHANE.

Marsh Mallow, or *Athaea*, genus of biennials or perennials (order Malvaceae). The common M. M. (*A. officinalis*) is a downy

plant occurring in marshes near the sea and bearing cymes of rose-pink flowers. A demulcent is prepared from the root. The rare hispid M. M. (*A. hirsuta*) is the only other Brit. species.

Marsh Marigold, or *Calluna palustris*, handsome plant with large kidney-shaped, glossy leaves and golden-yellow sepal-like petals being absent. It is common in watery places.

Marsh's Apparatus, see ARSENIC.

Marsi, proverbially brave and warlike people of the Sabellian race, dwelt in the centre of Italy. They were the prime movers of the celebrated war waged against Rome by the Socii or It. allies in order to obtain the Roin. franchise, and which is known by the name of the Marsic or Social war. Their chief tn. was Marruvium.

Marsico Nuovo, com. and tn. of Potenza prov., S. Italy, 16 m. S.W. of Potenza. Pop. about 7000.

Marsillac, Prince de, see LA ROCHEFOUCAULD, FRANCOIS.

Marsipobranchii, see CYCLOSTOMATA.

Marsivan, or **Merzifun**, tn. in the Amusla sunjak of Sivas vilayet, Asiatic Turkey, at the foot of the Tavshan Dagl., 85 m. S.S.E. of Sinope. There are silver mines and vineyards near vid hot baths at Khavza. Pop. 18,000.

Marske-by-the-Sea, watering-place on the N. coast of Yorkshire (N. Riding), England, 2 m. S.E. of Redcar, with iron-stone quarries. Pop. 3000.

Marsman, Hendrik (1899-1940), Dutch lawyer, poet, and short-story writer, b. at Zeist, in Utrecht. He began to write poetry when he was twenty, and he pub. his first vol. of poems, *Vergen*, in 1923. After sev. years of travel he studied law, and became an attorney at Utrecht. He eventually chose to devote himself entirely to a literary career, and he and his wife led a wandering life in Europe. In June 1940 the ship they were on was torpedoed, and the poet's life was lost. His collected works, *Ierzaameld Werk*, were pub. in 1938, and his last great poem, *Tempel en Kraus* (trans. *Temple and Cross*), in 1939.

Marston, Baron, see BOYLE, JOHN.

Marston, John (1575-1634), Eng. dramatist and satiric poet. As early as 1601 he was satirised under the name of Demetrius, in Ben Jonson's *Postaster*. However, in 1605, M. dedicated to Jonson, with expressions of affection and esteem, *The Malcontent*. In the same year he was associated with Jonson and Chapman in the composition of *Eastward Hoe*. For some reflections against the Scots in this comedy the authors were imprisoned. Shortly after this M., in his preface to his *Sophonisba*, hints at the plagiarisms from Rom. authors in Jonson's *Catiline* and *Sejanus*. M. and Jonson were the protagonists in the 'stage war' which then agitated London. With little of the imitative and inventive genius of the dramatist, M. had much of the spirited vigour and pungent wit of the satirist. In *The Scourge of Villanie* (1599) he is lofty and intrepid in his censure of vice, but is often carried by his vehement invective to the verge of coarseness. His other works

are *The Metamorphosis of Pigmalions Image* (a satire, 1598); *The History of Antonio and Mellida* (a tragedy, 1602); *Antonius Revenge* (a tragedy, 1602); *The Dutch Courtezan* (a comedy, 1605); *Parastaster, or the Faune* (a comedy, 1606); *What You Will* (a comedy, 1607); *The Insatiate Countesse* (a tragedy, 1613). There are eds. of his works by J. O. Halliwell-Phillipps (1856) and A. H. Bullen (1887); and of his poems by H. H. Wood (1934). See J. H. Peniman, *The War of the Theatres*, 1807; M. S. Allen, *The Nature of John Marston*, 1920; and Una M. Ellis-Fermor, *The Jacobean Drama*, 1936.

Marston, John Westland (1819-90), Eng. dramatist and critic, b. at Boston, Lincolnshire, the son of the Rev. Stephen M., Baptist minister. He left the legal profession for literature and the theatre. His first play, *The Patrician's Daughter* (1842), brought out by Macready, was accompanied with a prologue by Dickens. *The Heart of the World* (1847) was a failure, but *Strathmore* (1849) obtained a great success. Among his many dramas are *Marie de Méranie* (1850); *Donna Diana* (1864); *The Favourite of Fortune* (1866); *A Hero of Romance* (1867); *Broken Spells* (1873); and *Under Fire* (1895). He also wrote a number of poetical and critical works. He was joint editor of the *National Magazine* in 1837, and contributor to the *Athenaeum* from 1863. His claim on posterity is that he was long the main prop of the poetic drama on the Eng. stage, though his own powers were by no means equal to the task. A collection of his dramatic works, some much revised, was ed. by himself in 1876. See T. Powell, *Pictures of the Living Authors of Britain*, 1851.

Marston, Philip Bourke (1850-87), Eng. poet, b. in London, was the only son of J. Westland M. (q.v.). Through an accident received during childhood he lost his sight at an early age. His poems, *Song-side* (1871), *All in All* (1875), and *Wind-voices* (1883), bear the impress of this affliction, and of the death of his sister, Cicely (1878), his amanuensis, followed in 1882 by that of his poetic ally, Gabriel Rossetti. See memoir in Louise C. Moulton's ed. of his *Collected Poems*, 1892.

Marston Moor (Yorkshire), Battle of, fought on July 2, 1644, between the Royalists, under Prince Rupert, the earl of Newcastle, and Lord Goring, and the Parliamentarians, commanded by Lord Fairfax and the earl of Manchester, Cromwell commanding some cavalry on the left. The Royalists were completely routed after a bitter struggle.

Marsupials (from Lat. *marsupium*, pouch), also called Didelphia or Metatheria, form an important sub-div. of mammals, lying between the sub-divs. Prototheria, or Monotremata, and Eutheria, the placental mammals. The name Marsupialia (introduced by Tyson about 1698) is derived from the characteristic ventral pouch of skin supported by two epipubic bones in which the young, born very imperfectly developed after a short period of gestation, are carried and nourished by the females. Cuvier considers them, under the designation

Marsupiata, as a sub-div. of his Carnassiers (Carnivora). Existing M. are mainly restricted to the Australian and Austro-Malayan regions. The two main divs. are (1) Polyprotodontia (America and Australasia), including the Didelphidae (Amer. opossums), dasyures, the thylacine or Tasmanian wolf, marsupial moles (*Notoryctes typhlops*), and bandicoots. They are mostly carnivorous and insectivorous and the pouch is often absent. (2) Diprotodontia (Australasian), and a few in E. Austro-Malayan Is., including the wombat, koala, or sloth, cuscus kangaroo (Macropodidae family), wallaby, and phalanger. These are herbivorous, and represent the most highly evolved forms.



MARSUPIAL: SLOTH

of the M. Fossil species of this group are found in the Trias of Europe and the Jurassic of N. America. See GEOGRAPHICAL DISTRIBUTION; MAMMALS.

Marsyas, Phrygian satyr who found Athena's flute, which of its own accord emitted the most beautiful music. Thereupon M. challenged Apollo to a musical contest, the conditions of which were that the victor should do what he pleased with the vanquished. The Muses decided in favour of Apollo, who bound M. to a tree and flayed him alive. His blood was the source of the R. M. There is a statue of M. in the forum of Rome. See Ovid, *Metam.*, vi., 382-99, and Sir J. G. Frazer in *Adonis, Attis and Osiris* (chap. vi.), 1906.

Martaban, vil. of Lower Burma, on the Salwin R., 10 m. N.W. of Maulmain. Formerly, the cap. of Pegu and a place of importance.

Martaban, Gulf of, inlet of the bay of Bengal, which receives the three rvs., Irrawaddy, Sittaung, and Salwee.

Martel, Charles, see CHARLES 'MARTEL.'

Martel de Janville, see GYR.

Martelli, Pier Jacopo (1665-1727), It. dramatist, b. at Bologna. Hero in 1707, he was appointed prof. of eloquence. He wrote a religious poem entitled *Degli Occhi di Gesù*, and sev. tragedies, comedies, and farces. His collected works appeared

at Bologna in 1733, and Cologniere wrote his biography in the *Opuscoli*, ii., 1729. M. employed the Alexandrine verse rather than the It. form in most of his works.

Martello Towers, round towers formerly used in Eng. coast defence. The name is derived from Mortella Point in Corsica. In 1794 an Eng. fleet, under Lord Hood, supported the Corsican insurgents, and a small round tower on the point withstood their fierce cannonade. The strong resistance shown by this tower led to towers of a similar nature being erected along the Eng. shores, especially on the S. and E. coasts. They are about 40 ft. high and situated on the beach.

Marten (*Mustela*), name given to a number of animals of the weasel family, but applying specially to the pine M. (*M. martes*), and the beech or stone M. (*M. foina*). The pine M. still occurs in the N. of England and Scotland. In shape it resembles a stoat, but its body is much longer, the tail alone being often a foot long, the legs are short, and the paws have sharp, clawed digits. The fur is a beautiful dark brown with a large yellow patch on the breast. The beech M. or stone M. of the S. of Europe (with a white patch) supplies the fur trade with stone or baum M. skins. Other species include the pekan (q.v.), or fisher M. (*Martes pennanti*), and the sable (q.v.). The toul M., or foumart, is the polecat (q.v.). All the Ms. are arboreal, frequenting coniferous woods, where a nest of leaves or moss is made, and feeding on small animals and birds. If taken young Ms. are easily tamed, and the beech M. was kept in Athens and Rome to catch mice.

Martens, Conrad (1801-78), Australian artist, b. in London, studied art under Copley Fielding. For two years M. was official topographer in the *Beagle*. He settled in Sydney, and was one of the first to win a reputation as an Australian artist. His most successful paintings are his studies and sketches of Sydney Harbour.

Martensen, Hans Larsen (1808-81), Dan. ecclesiastic and theologian, b. at Flensburg. Became prof. of theology at Copenhagen and court preacher. Among his theological pubs.—which often diverged in some degree from strict Lutheran orthodoxy and revealed a leaning to mysticism—were treatises on Christian dogmatism and ethics, moral philosophy, and, especially, a life of the famous Ger. mystic Jacob Boehme (q.v.). In a new ed. of this work by Stephen Hophouse (1949) is told the strange story of the discovery in 1931 by Dr. Werner Buceccke of Göttingen of the original MS. of Boehme's *Aurora* in which the mystic sets down his apocalyptic vision—and many Boehme letters, all of which had been handed down as heirlooms within the confines of a secret fellowship of admirers of Boehme for some 250 years. M. was appointed bishop of Zealand in 1884. An 'official' panegyric which he pronounced on Bishop Mynster on his death in 1854 brought down the fierce invectives of Kierkegaard on the text 'a witness of the truth.'

Martensite, constituent responsible for the hardness of quenched steels, consisting of needle-shaped crystals interlaced at 60°. The structure is caused by carbide being deposited along the planes of cleavage of the original austenite grains, and the more carbon there is in the steel the greater is the hardness of M.

Martha, St., traditional sister of Mary and Lazarus, the patron saint of good housewives, represented in art in homely garb, with a bunch of keys in her girdle and a pot in her hand. Festival, July 30.

Martha's Vineyard, is in the Atlantic Ocean off Massachusetts, U.S.A., 23 m. long. It forms the greater part of Dukes co., and was so named by the Gosnold expedition on account of the excessive growth of vines. Pop. 5600.

Martialis, Marcus Valerius (c. A.D. 40-c. 104), epigrammatic poet, b. at Bilbilis in Spain. He went to Rome in 66; and after residing in the metropolis thirty-five years he returned to the place of his birth in 100. His death cannot have taken place before 104. His fame was widely extended, and he secured the patronage of the Emperors Titus and Domitian. His extant works consist of a collection of short poems, all included under the general appellation *Epigrammas*, divided into fourteen books. They are distinguished by fertility of imagination, flow of wit, and felicity of language; but they are defiled by impurity of thought and expression, and by base flattery of the Emperor Domitian. M. throws a valuable light on the social life of Rome in the first century of our era. Eds. of M. include those of Schneidewin (d. 1856). Friedlander (with commentary) (1886), and M. Lindsay (1903). There are Eng. trans. of the *Epigrams* in the Loeb Classics and the Broadway Translations.

Martial Law. This expression is used by writers on constitutional law in a three-fold sense: (1) The suspension of the ordinary or municipal law of a country in favour of the temporary gov. of the country or parts of it by military tribunals. In the Code Napoléon of France there is express provision for the proclamation of 'a state of siege' in certain circumstances of civil disorder, the effect of which is that military tribunals are empowered to try civilians by military law. The absence of precedent for such course of proceeding since the Petition of Right, 1628—which, *inter alia*, complained of the enforcement of M. L. against private individuals—led many writers to assume that it is unknown in England. But the decision of the Privy Council in the case of *Marais v. General Officer Commanding*, in 1902, on the appeal of a civilian, Mr. Marais, against his detention under military arrest during the S. African war, is that there never was any doubt that in time of war the ordinary courts have no jurisdiction over the action of military authorities, the difficulty being to establish when in fact a state of rebellion or insurrection could be said to have existed. This can only be effected by an *ex post facto* decision of the civil courts, with

whom, therefore, the last word remains as to the legality of the actions of the military authorities. An Act of Indemnity may of course be passed to protect these latter from actions brought as a result of the application of M. L. (2) The term is sometimes erroneously used to denote the *common law* right and duty, of the Crown, its servants and all citizens to repel force by force in the case of any violent resistance to the law, whether by invaders or rioters. (3) As a synonym for military law, or the law administered either (a) by the long-abolished Court of Chivalry of the earl marshal and lord high constable in affairs of honour, and generally in 'matters of arms and deeds of war,' or (b) by courts-martial at the present day in matters of military discipline. See also DEFENCE OF THE REALM ACT. See Sir C. G. Robertson, *Select Statutes, Cases and Documents illustrating English Constitutional History, 1660-1832* (7th ed.), 1936; S. T. Banning, *Military Law* (24th ed.), 1942; and *see also* bibliography to CONSTITUTIONAL LAW.

Martignes, Prince de, *see* GALLIFFET. MARQUIS DE.

Martigny, three united hamlets in the canton of Valais, Switzerland, 16 m. S.W. of Sion. It is the starting-point of routes over the Great St. Bernard and the Col de la Forclaz, and is situated on the Simplon Railway, 24 m. S.E. of the lake of Geneva. It has some interesting Rom. remains. Altitude 1560 ft. Pop. 3200.

Martigues, seaport in the dept. of Bouches-du-Rhône, France, near the Étang de Berre, 21 m. S.W. of Aix. It is built on three ls. connected by bridges, and has fisheries and lignite mines. Pop. 11,200.

Martin, Saint (316-400), bishop of Tours, and a saint of the Rom. Catholic Church, b. in Pannonia (now Hungary). He entered the army first under Constantine, and afterwards under Julian the Apostate. The virtues of his life as a soldier are the theme of more than one interesting legend. On obtaining his discharge from military service, M. became a disciple of Hilary, bishop of Poitiers. On his return to Gaul about 360, he founded a convent of monks near Poitiers, where he led a life of austerity and seclusion; but in 371 he was drawn by force from his retreat and ordained bishop of Tours. The only extant literary relic of M. is a short *Confession of Faith in the Holy Trinity*, which is pub. by Galland, vol. vii., 599. In the Rom. Catholic Church the festival of his birth is celebrated on Nov. 11. In Scotland this day still marks the winter term, which is called Martinmas (the Mass of St. Martin). He was the greatest pioneer of W. monasticism before St. Benedict. See monographs by C. Babut, 1912, and P. Lutod, 1930.

Martin, name of five popes:

Martin I. (649-53), b. at Todi, in Umbria, taken captive to Constantinople in 653 and then banished to Kherson by the Emperor Constans II. for his opposition to the Monothelites. He d. in 655. He is canonised by the Gk. Churches.

Martin II., or improperly named

Martinus I. (882–84), had been sent by Adrian II. as legate to Constantinople to preside over the eighth general council (869–70), concerning the controversy excited by Photius.

Martin III., or *Martinus II.* (942–46), was merely a puppet of Alberic (*d.* 954), a prince and senator of the Romans.

Martin IV. (1281–85), a Frenchman named Simon de Briec, supported Charles of Sicily against Peter of Aragon and excommunicated Michael Paleologus.

Martin V. (1417–31), whose name was Oddo Colonna, *b.* at Cennazano, was chosen pope by the Council of Constance, thus ending the Great Schism. He left Avignon for Rome 1418, and made separate concordats with Germany, France, and England. See F. Hayward, *History of the Popes*, 1931.

Martin, Gregory (*d.* 1582), Eng. biblical translator, native of Mansfield, Nottingham. He organised the Eng. College at Rome (1577), and removed with that institution to Rheims, where he remained for the rest of his life. He trans. the Bible into Eng. from the Lat. Vulgate, the first ed. appearing at Rheims; it was reprinted at Antwerp in 1600; revised by Bishop Challoner (1749–50), and reprinted by George Leo Haydock in 1812, and by Frederick Charles Husenbeth in 1850.

Martin, John (1789–1854), Eng. painter, *b.* near Hexham, in Northumberland. In 1806 he went to London, and six years later his 'Sadak in Search of the Waters of Oblivion' was hung in the Royal Academy, attracting considerable attention. His paintings give the impression that they were inspired by dreams. Massive perspectives, gigantic crags, and towering battlements have the unreal quality of nightmare. The effect is heightened by the smallness and multitude of his human figures, all executed in precise detail, and by a recurring tunnel theme, achieved by architectural design or the circular movement of wave or cavern. But doomed cities and the wrath of God are not his only subjects, and there is a luminous serenity in the 'Paradise Lost' engravings and in his last picture, 'The Plains of Heaven.' See T. Balston, *John Martin 1789–1854: his Life and Works*, 1948.

Martin, Lady, see FAUCIT, HELENA SAVILLE.

Martin, Sir Theodore (1816–1909), Brit. author, was the son of an Edinburgh solicitor, and followed his father's profession. In 1846 he set up as a parl. agent, and soon acquired a large practice and amassed considerable wealth. In 1851 he married Helena Faucit, the actress, (*q.v.*). He was early attracted to letters, and with Aytoun wrote the *Bon Gaultier Ballads* (1842–44), a series of parodies after the style of *Rejected Addresses*, but inferior to that collection. In 1866 he was invited to write the official *Life of the Prince Consort*. The work was pub. in 5 vols. (1874–80). He also wrote a biography of Lord Lyndhurst (1883), and trans. the *Odes* of Horace, Dante's *Vita Nuova* and Goethe's *Faust*.

Martin, William (c. 1767–1810), Eng. naturalist, *b.* at Mansfield, Nottingham-

shire. He is famed for his works on Brit. fossils: *Petrifasta derbiensis; or, Figures and Descriptions of Petrifications collected in Derbyshire* (1804); and *Outlines of Extraneous Fossils on Scientific Principles* (1809).

Martin, name for some members of the swallow family, but usually implying the house martin (*Chelidon urbica*), which builds a mud nest under the eaves of the houses. It is 5½ in. long. The plumage of the upper parts is black with violet reflections, and of the lower pure white. It differs from the swallow chiefly in having a white band across the lower back. Other Ms. include the sand M. (*q.v.*), the Amer. purple M., and the fairy M.

Martina-Franca, tn. in the prov. of Lecce, Italy, 17 m. N.N.E. of Taranto, has a fine ducal palace. Pop. 25,000.

Martin de Porres (1579–1639), saintly S. Amor. Negro and patron of social justice, *b.* at Lima, Peru. As a boy he picked up the medical knowledge of the time, and in 1603 was admitted to the Dominican order. Thereafter his wonderful powers of healing and his saintly personal life, especially among the poor and outcast, estab. him as the pioneer social worker and friend of coloured peoples. Beatified by Gregory XVI. in 1837.

Martin du Gard, Roger (*b.* 1881), Fr. novelist. *b.* at Neuilly-sur-Seine of a Catholic family, was educated at the Lycée Condorcet and later spent three years at the Ecole des Chartes where he was awarded a diploma as archivist and palaeographer. His archaeological thesis, *Etude archéologique des ruines de Jumièges*, was written at this time and pub. in 1909, the same year as his first novel, *Derenir*. This work showed the influence of Flaubert and Tolstoy. His second novel, *Jean Barois* (1913), was a more capable work and revealed M. as a penetrating social historian. Following the success of *Jean Barois* he became interested in the formation of the theatrical group, the 'Vieux Colombier,' for which he wrote two farces, *Le Testament du père Leleu* and *La Gonfle*. In his novels he follows the tradition of the Fr. realists of the nineteenth century, and brings to his subject a capacity for scientific observation and objective research. He has a lucid, detailed, and restrained style and places his narrative against a background of the events of the time. His ample construction allows a variety of incident and a careful building up of character. Such are the characteristics of his long series of novels which under the general title of *Les Thibault* carry the story of two families, one Catholic and one Protestant, through eight books, *Le Cahier gris* (1922), *Le Pénitencier* (1922), *La Belle Saison* (1923), *La Consultation* (1928), *La Mort du père* (1929), *L'Été 1914* (1936), and *Epitogue* (1940). The first two, *The Grey Note-book* and *The Reformatory*, were pub. in an Eng. trans. in 1933, and *High Summer* and *Consulting Day* in 1934. A new trans. of the whole work was pub. in 1940 with the

title *The Thibaults*. After the pub. of *L'Été 1914* M. was awarded the Nobel prize for literature (1937). M.'s work is remarkably unaffected by political ideology. He himself has remained aloof from politics, and after the fall of France in 1940 he escaped into the unoccupied part where he remained for the remainder of the war. See R. Lalou, *Roger Martin du Gard*, 1937.

Martineau, Harriet (1802-76), Eng. novelist and political economist, b. at Norwich, England, suffered in youth from bad health and later for a time from something akin to religious mania. Without any intention of devoting herself to literature, she wrote, at the suggestion of her younger brother, a short paper on 'Female Writers on Practical Divinity' which was reprinted in the *Monthly Repository* (1821). This encouraged her, and she composed some verses, short stories, and a theological novel. *Devotional Exercises* appeared in 1823, *Traditions of Palestine* in 1830. Between 1832 and 1834 she brought out in nine vols. *Illustrations of Political Economy*, and followed this with *Poor Laws and Paupers Illustrated* (1833-34) and *Illustrations of Taxation* (1834). She wrote a *History of England during the Thirty Years' Peace* (1849-50) and a work on *Household Education* (1849). She issued books on mesmerism (1845) and the *British Rule in India* (1857) with equal facility and unbounded confidence. She was the author of sev. stories. Perhaps the best thing she wrote was *Fests on the Fjord*. Her autobiography was pub. in 1877. See lives by Mrs. Fenwick Miller, 1884, and Theodora Bosanquet, 1927.

Martineau, James (1805-1900), Eng. Unitarian theologian, younger brother of the preceding, b. at Norwich. Possessed of considerable inventive and mathematical talents, he was originally intended for engineering, but studied for the Unitarian ministry, to which he was ordained in 1828. In 1840 he became prof. of mental and moral philosophy in the Manchester New College (subsequently removed to London), and principal in 1869-85. Among his writings, which were very influential, are *Rationale of Religious Inquiry* (1836); *Ideal Substitutes for God* (1879); *Study of Spinoza* (1882); *Types of Ethical Theory* (1885); *Study of Religion* (1888); *Seat of Authority in Religion* (1890); and religious poems and hymns. See J. Estlin Carpenter, *James Martineau, Theologian and Teacher*, 1905.

Martinet, military term, used usually in an uncomplimentary sense, implying a strict disciplinarian. Derived from one Jean M., an officer in the army of Louis XIV.

Martínez de la Rosa, Francisco de Paula (1789-1862), Sp. statesman and man of letters, b. in Granada. He took part in the national cause when Spain was invaded by France (1808), being sent to Gibraltar to negotiate with the Brit. Gov. In 1812 he was elected deputy to represent Granada in the Cortes, where he so identified himself with the Liberal cause as to arouse the hostility of Ferdinand VII.,

who exiled him. In 1820 he was again elected, and again had to resign. He then resided in France. In 1833 he was recalled to Spain and held various political offices until 1861—twice being chief minister. One of his ministries is famous in the hist. of Spain by the treaty with Lord Clarendon, abolishing the slave trade. Some of his works are *La Viuda de Padilla* (1814) and *Aben Humeya* (1830) (both dramas); *Zaragoza* (1809, a poem); *El Espíritu del Siglo* (Spirit of the Age, 1833-51); and a life of *Pérez del Pulgar*. See life by I. de Sosa, 1930.

Martinez, Ruiz José (b. 1873), Sp. essayist critic, novelist, and dramatist, who wrote under the pseudonym of Azorín, was b. at Monóvar, Alicante. He was educated at a religious boarding school, his experiences forming the subject of *Los confesiones de un pequeño filósofo* (1904), and later studied law at Valencia Univ. He went to Madrid about 1898, soon attracting attention by his radical writings and campaigns. Pamphlets and critical works were pub. containing strong attacks on accepted values, literary and social. Two autobiographical novels, *La Voluntad* and *Antonio Azorín*, appeared in 1902 and 1903. Together they constitute a witness for the unrest of spirit amongst intellectual youth of his time, for the many conflicts, between reason and sentiment, energy and inaction, tradition and progress, which beset them. In the greater part of his writings, over 50 vols. in all, he strives to convey the essential spirit of Spain viewed by a critical and poetical observer, in whom sentiment is ultimately stronger than criticism. The feeling for atmosphere and for time finds its centre in Castilian landscape and hist., in works such as *Los Pueblos* (1905), and *Castilla* (1912). In all his work, criticism, essays, drama, and novels, is an intensely personal tone, and he is at the forefront of the intellectual subjectivist movement of the 'Generation of '98.' His influence in the first two decades of the century was very powerful, and in his turn he was much affected by modern European literature, especially the Impressionists and symbolists of France. His dramatic works include *Old Spain* (1926) and *Brandy, mucho Brandy* (1927); some of his short stories were trans. (1931) into Eng. as *The Syrens and other Stories*; his literary criticism is exemplified in *Lecturas españolas* (1912); *Clásicos y modernos* (1913); *Los valores literarios* (1913); and *Al margen de los clásicos* (1915). There is a vein of pure poetry in works such as *Don Juan* (1922; Eng. trans., 1923); *Doña Inés* (1925); and *Félix Fargas* (1928). See essay by S. de Madariaga in *The Genius of Spain and other Essays on Spanish Contemporary Literature*, 1923; and W. Mullert, *Azorín* (Sp. trans. from the Ger.), 1930.

Martinezia, genus of small palms with pinnate leaves of the family Palmae. *M. caryotae* is a handsome stovehouse plant.

Martinez Sierra, Gregorio, see SIERRA.

Martin-Harvey, Sir John (1863-1944), Eng. actor, b. at Wyvernhol, Essex, son of

John Harvey, naval architect. He was educated at King's College School, London, with a view to taking up naval architecture, but abandoned this for the stage, and studied elocution under John Ryder. He made his first appearance at the Old Court Theatre under John Clayton, but ultimately joined Sir Henry Irving, with whom he remained for many years. Early in his career he married Angelita Helena de Silva, daughter of Don Ramon de Silva Ferro, a capable and charming actress, who was his leading lady through most of his stage life. The choice of the part of Sydney Carton as that best suited to his talents was due to her suggestion, as also was the writing of the play, *The Only Way*, from Dickens's *A Tale of Two Cities*, by the dramatist Freeman Wills. This play estab. him in his position as actor-manager, and though he still played much in the provs., as when he had toured with Irving's consent in old Lyceum successes, he now had a regular London season. In the repertory of romantic drama he won fresh popularity with the parts of Lt. Reresby, 'The Rat', in *The Breed of the Treshams*, and Skarlatine in *A Cigarette-Maker's Romance*, as well as in *The Bells*, *The Lyons Mail*, and others of Irving's successes. Among his most striking performances was his Pelleas to Mrs. Patrick Campbell's Mélisande in Maeterlinck's play, while his impressive production of *Edipus Rex* afforded scope for the stagecraft of Max Reinhardt (q.v.). Other parts included the Prophet Samuel in Barrie's *The Boy David*, and the burgomaster in Maeterlinck's *The Burgomaster of Stilemonde*. During the First World War he gave, for the benefit of the Red Cross, a series of Shakesperian performances playing Hamlet, Petruchio, Richard III., and Henry V. Among his productions were also *Eugene Aram*, *Great Possessions*, *The World and his Wife*, *The Last Heir*, *An Idyll of Seven Dials*, and *The Shewing-up of Blanco Posnet*. During his career he managed the Lyceum, the Prince of Wales's, the Court, the Royal, and the Apollo theatres, and Covent Garden Opera House. His *Autobiography* appeared in 1933. See M. W. Disher, *The Last Romantic*, 1947.

Martini, Frederic (1832-97). Swiss engineer, was Hungarian by birth and Swiss by adoption. After serving in the Austrian Army in the war of 1859, he estab. machine works at Frauenfeld in Switzerland. Here in 1871 he invented the breech-loading mechanism of the rifle which bears his name—the M.-Henry. Henry was the name of the inventor of the barrel.

Martini, Giovanni Battista, or Giambattista (1706-81), It. priest, composer, and teacher, was b. at Bologna. Entering the Franciscan monastery at Lago he was ordained in 1722. In 1725 he returned to Bologna, became chapel master at the church of San Francesco, and continued his musical studies, with Perti. He collected a vast musical and scientific library, devoting himself to mathematics as well as to music. He became the most famous musical theorist and teacher of his

time. Mozart being amongst his many famous pupils. A hist. of music, *Storia della Musica* (1757-81), and a treatise on counterpoint, *Saggio di Contrappunto* (1774-75), are among his works. His musical compositions include masses, Requiem, motets, and other church music, as well as oratorios, songs, keyboard pieces, arias, etc. See L. Busi, *Il padre Martini*, 1891.

Martinique, is. of the Windward group, W. Indies, belonging to France. It is very irregular in form, and is about 50 m. in length from N.W. to S.E., by about 15 m. in mean breadth. Area 382 sq. m. The surface is uneven and mountainous, and has sev. volcanoes. The highest point in the is. is the volcano Mont Pelée, which rises to the height of 4450 ft. An eruption of this volcano in 1902 destroyed the tn. of St. Pierre with all its inhab., some 26,000 lives being lost. St. Pierre, before this eruption, was one of the chief ports of the W. Indies, but this whole section of M. was utterly devastated by that catastrophe. In the past 300 years there have been over thirty severe hurricanes, seven earthquakes, three volcanic eruptions, and five serious conflagrations. Alcohol and rum are the chief products of M. Sugar cane was introduced from Brazil in 1654, and by the beginning of the eighteenth century M. had become one of the wealthiest of the Caribbean is. The plain of Lamentin, bordering the bay of Fort de France, is the only large area of level land in the is., and is covered with cane-fields to the exclusion of any habitation. No other commercial crops have ever received much attention in M. Coffee, cacao, cotton, vanilla, bananas, and pineapples are grown from time to time, but without any great success. Rum from M. has a very high reputation. The coast, being indented by numerous bays and inlets, affords many good harbours. Fort de France is the chief tn. and the political cap. It is also the prin. naval station of France in the W. Indies. M., the native name of which is Madiana, was discovered by the Spaniards in 1493 (according to some historians M. was discovered by Columbus in 1503), and colonised by the Fr. in 1635. It was taken by the Eng. in 1762, and again in 1794 and 1809; and was finally given up to France in 1814. Pop. 261,600. See L. Hearn, *Two Years in the French West Indies*, 1889, and P. E. James, *Latin America*, 1941.

Martinmas, feast of St. Martin of Tours, Nov. 11, and in Scotland one of the four term-days for paying rent.

Martino, Edoardo de. It. marine painter, b. at Malta, now Naples, and appointed marine painter in ordinary to Queen Victoria in 1875. His paintings include four pictures of the battle of Trafalgar.

Martins Bank, estab. as the Bank of Liverpool by deed of settlement in 1831; registered as limited, 1882. Name changed to Bank of Liverpool and Martins Ltd. in Dec. 1918 and to its present title in Jan. 1928. It acquired the undertakings of Arthur Heywood Sons and Company in

1883; Liverpool Commercial Banking Company in 1889; Cravon Bank in 1906; Carlisle and Cumberland Banking Company in 1911; N.E. Banking Company in 1914; M. B. Ltd. in 1918; Halifax Commercial Banking Company in 1920; and the Lancashire and Yorkshire Bank in 1928. Authorised capital, £20,791,120; issued capital, £20,602,272; called up £4,160,042 in 939,556 shares of £20 (with £2 10s. paid) and 1,811,152 (part of 2,000,000) shares of £1 (fully paid). Of the £17 10s. uncalled on the £20 shares, £5 10s. is callable and £12 a reserve liability. Reserve, £4,100,000. Current, deposit, and other accounts, £212,691,885. Head office, Water Street, Liverpool; London city office, 62 Lombard Street, E.C.

Martinsburg: 1. Bor. in Blair co., Pennsylvania, U.S.A., in a fertile valley known as Morrison's Cove, 15 m. S. by E. of Altoona. Pop. 1200. 2. Tu. of W. Virginia, U.S.A., co. seat of Berkeley co., 71 m. N.W. of Washington. Fruit, particularly apples and pears, is grown, and canned in large factories. There are also lime and flour factories, woollen mills, and railroad shops. Limestone is quarried. Pop. 15,000.

Martin's Ferry, banking city of Belmont co., Ohio, U.S.A., 2 m. from Wheeling. Coal is found in abundance and there are engine and machine works, glassworks, tin mills, etc. Pop. 14,700.

Martinu, Bohuslav, Czech composer, b. 1890 at Poltka, was a pupil of Suk at Prague and of Rousset in Paris. For a time he was a violinist in the Czech Philharmonic orchestra, but in 1923 he attracted attention as a composer at the Siena festival. His work includes operas, ballet music, radio operas, and a great variety of symphonic pieces, concertos for violin and for piano, preludes, etc. There is in his music a strong vitality and sense of rhythm, as well as a resonance and a supple strength of construction.

Martius, Karl Friedrich Philipp von (1794-1868), Ger. naturalist and traveller, director of the botanic garden (1820) and prof. of botany (1826) at Munich. Among his works are *Historia Naturalis Palmarum* (1823-53); *Reise nach Brasilien* (1824-31); *Nova Genera et Species Plantarum* (1821-32); *Icones Plantarum Cryptogamicarum* (1828-34), etc.

Martos, tn. of Andalusia, Spain, 10 m. W.S.W. of Jaen, on a steep hill. Noted for its wines and mineral waters. Pop. 20,000.

Martyn, Henry (1781-1812), Eng. missionary, b. at Truro, and educated at Cambridge. At Dinapore he trans. the N.T. into Hindustani, and superintended the Persian trans. of the N.T. by Sabat and Sebastiani. At Shiraz in Persia he revised the Persian and Arabic trans. of the N.T., also completed a new trans. of the Psalms.

Martyr (Gk. μάρτυς, or μάρτυρις, a witness), term used to designate those people who in the conflict between Paganism and Christianity bore 'witness' to the truth of their convictions by sacrificing their lives rather than abandon their faith.

Many instances are recorded, and the number is probably exaggerated, but that a very great number suffered for the truth's sake is certain. Such persons who met their death, often with the utmost heroism, were regarded with the greatest admiration by their fellow men, and it was considered a special privilege to receive the benediction of a M., to visit him in prison, or to kiss his chains. Then, too, after death he was regarded as a saint, his grave was the scene of pilgrimage, his clothes, portions of his body, books, etc., were honoured as relics, and the day of his martyrdom was celebrated with peculiar honour as his natal or birth day. The first recorded M. of Christianity was Stephen, an account of whose death is given in Acts vi. and vii., and the proto-M. of Britain was Alban of Verulam, who suffered about 286 under Diocletian. The use of a *Martyrology*, a list or catalogue of Ms. on saints, arranged in the order of their anniversaries, is common to both the Rom. and the Gk. Church (although in the latter it goes under a different name, i.e. menology), and was intended as a guide to the faithful in their devotions. The most important anct. martyrology is the Hieronymian, falsely said to have been compiled by St. Jerome, and next to this came the Lesser Rom. and Bede's martyrology, the last of which has come down to us in that of Florus of Lyons; Rhabanus Maurus (c. 845); Ado of Vienna (c. 875); Usnard of Paris (c. 875), the most famous, on which the Rom. martyrology was based; Notker (896); and St. Gall (912). The official 'Roman martyrology' designed for the entire Church, was pub. in the time of Gregory XIII. (1581), and two years later Baronius pub. an annotated ed. It was revised under Benedict XV. (1922). The best known list of the Gk. Church, or 'menology,' was that compiled by order of the Emperor Basil, the Macedonian, in the ninth century. This was ed. in 1727 by Cardinal Urbini. In 1866 Thomas Wright (1810-77), in the *Journal of Sacred Literature*, pub. a Syriac martyrology which had been written about 412. Protestant Ms. of the sixteenth century are celebrated in Jean Crespin's *Histoire du Martyrs*, and the chief Eng. work on the same subject is John Foxe's *Book of Martyrs*. See A. Schlatter, *Die Märtyrer in den Anfängen der Kirche*, 1915; A. Butler, *Lives of the Saints*, 1926-37; A. Ehrhard, *Die Kirche der Märtyrer*, 1932; and G. H. Doble, *The Exeter Martyrology*, 1933.

Marugame, seaport of Japan, 80 m. W.S.W. of Kobe, on the is. of Shikoku. Pop. 30,000.

Maruthas, bishop and saint (d. c. 1415), was a prominent personality in the Syrian Church. Bishop of Maferkat in Mesopotamia, he devoted himself to the reorganisation of the Church in E. Syria and Persia. He collected the *Passiones* of the Persians and Syrians martyred under Shapur, and wrote hymns in their honour.

Maruts, Vedic storm and wind gods, companions of Indra. In anct. mythology the sons of Rudra and Prisni, in later the sons of Kasyapa and Aditi.

Marvell, Andrew (1621-78), Eng. poet and politician, b. at Winestead in Yorkshire, and educated at Hull Grammar School and Trinity College, Cambridge. Early became known for his verses. About 1650 he was appointed tutor to Mary, daughter of Lord Fairfax, and later to Cromwell's ward, Wm. Dutton. He made the acquaintance of Milton, and in 1657 became his assistant in the Lat. secretaryship. Three years later he was returned to Parliament by Hull, and he represented that constituency until his death. In 1663 he accompanied Lord Carlisle as secretary on a mission to the courts of Russia, Sweden, and Denmark, and pub. an account of the embassy (1669). Little, however, is known of his life, and little has been written about him, except in occasional essays, and the man himself remains difficult to envisage. Thus the general steadiness of his temper can almost be deduced from his poetry, but not the outbursts of violence which sometimes characterised his personal relations. Yet a man who could attend Parliament, and such a Parliament as that of Charles II., for twenty years as member for Hull, and faithfully report to his constituents what was happening, and how he served them, was a man either of great patience or of great serenity. Through it M. seems to have maintained that glowing vitality of feeling and thought which finds such an exquisite expression in his poetry; its mild luminosity shines out even in his controversy about toleration with the famous Parker. He wrote verses eulogising Cromwell, notably the *Horation Ode upon Cromwell's Return from Ireland* and the lines *Upon the Death of his late Highness the Lord Protector*, and after the Restoration wrote satires upon the king and other members of the reigning house. He was an active pamphleteer. His prin. prose works are *The Rehearsal Transposed* (1672) and *An Account of the Growth of Popery and Arbitrary Government in England* (1677). His poems were first collected in 1681, and the best ed. is that ed. by G. A. Aitken in 1892. See lives by J. Dove, 1832; A. Birrell, 1905; and M. C. Bradbrook and M. G. Lloyd Thomas, 1940.

Marwar, see JODHPUR.

Marx Brothers, Jewish-Amer. family of film comedians; Arthur (Harpo) was b. 1893, Julius (Groucho) in 1895, and Leonard (Chico) in 1891. Herbert (Zeppo) was b. in 1901, and retired from the troupe after 1934. They estab. a distinctive style of clowning and achieved very great popularity. Among their film successes are *A Night at the Opera* (1936); *A Day at the Races* (1937); *The Big Store* (1941); and *A Night in Casablanca* (1946).

Marx, Heinrich Karl (1818-83), founder of revolutionary socialism, was a Ger. subject of Jewish extraction, b. at Trier. After starting the soon-suppressed *Rheinische Zeitung* at Cologne he was, from 1843 to 1845, in Paris, where he was converted to Socialism by reading Proudhon. Here also he met Engels, his lifelong partner and friend. From France he was expelled for publishing another jour., *Die Vorwärts*, and he came to London, which

he made his permanent home. With Engels he pub. the *Communist Manifesto* in 1847. Thereafter he devoted himself almost exclusively to the development of his economic ideas, for although he was virtual leader of the International Working Men's Association, he never held high office in it. His works include the famous *Capital*, the first vol. of which appeared in 1873 (the second and third vols. were prepared); *Revolution and Counter-Revolution in Germany, 1848-49* (1891); *The Poverty of Philosophy* (1910); *The Civil War in France* (1921); *Critique of Political Economy* (1922); *The Class Struggle in*



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KARL MARX

France (1924); *Value, Price, and Profit* (1925); and *The 18th Brumaire of Louis Bonaparte* (1926). For an examination of his principles, see under CAPITAL AND CAPITALISM. See also ANARCHISM; COMMUNISM; INTERNATIONAL, THE; SOCIALISM. See M. Beer, *Life and Teaching of Karl Marx*, 1925; K. Kantsky, *The Economic Doctrines of Karl Marx*, 1925; G. J. H. Cole, *What Marx Really Meant*, 1934; E. H. Carr, *Karl Marx*, 1938; L. Berlin, *Karl Marx*, 1939; L. Schwarzschild, *The Red Prussian*, 1948; and L. Trotsky, *Mars*, 1948.

Mary, The Virgin, Mother of Jesus. The only authentic sources for her life are the Gospels. In St. Luke we learn of the announcement to her by the angel that she should conceive a son by the overshadowing of the Holy Ghost, of her being espoused to Joseph, a carpenter belonging to the house of David, of the events connected with the birth of Jesus, and of the presentation in the temple; of the flight

into Egypt we learn in Matt. ii., and of the finding of the child Jesus twelve years later, after he had disappeared from the caravan returning from Jerusalem, in Luke ii.; of her presence and action at Cana in John ii., of her presence when Jesus was preaching in Mark iii. 31, and of her presence at the foot of the cross and the word of Our Lord consigning her to the care of the apostle John in John xix. 26. Finally her presence among the apostles after the Ascension is mentioned in Acts i. 14. Nothing is told us of her death. The apocryphal gospels give many untrustworthy details of her early life. According to tradition she was the daughter of Joachim and Anne, and on her death she was taken up bodily into heaven, an event celebrated by the E. and Rom. Catholic Churches in the feast of the Assumption, Aug. 15. Other feasts commemorating events in the life of M. are the Nativity (Sept. 8), the Presentation of M. in the temple (Nov. 21), the Annunciation or Lady Day commemorating the visit of the archangel Gabriel, Luke i. 26, 27 (March 25), the Visitation, or visit made to her cousin Elizabeth, Luke i. 39, 40 (July 2), the Purification or churcheing after the birth of Christ, popularly known as Candlemas, Luke ii. 25 (Feb. 2), and the Immaculate Conception (Dec. 8). This last, instituted by Pius IX. in 1854, has nothing to do with the Virgin Birth or birth of Christ without the agency of man, but commemorates the complete freedom of M. from all taint of sin, i.e. she was conceived immaculate or unstained. The title of Mother of God (*Mater Dei*) was formally awarded to M. by the Council of Ephesus in 431, after the controversy occasioned by the patriarch Nestorius of Constantinople; it was inferred from the fact that she was the mother of Christ, who was God. M. has been the object of profound popular devotion in both the E. and W. Church, for by her motherhood of Christ she is deemed the supreme intercessor with her Son. The countless images and paintings of M. with her Child are all inspired by the thought that through the Virgin Mother of God the human touched the divine. The most striking phenomenon in modern times in devotion to Our Lady is the apparition claimed for her at Lourdes in S. France, on eighteen occasions in 1858. This has received official recognition by the Rom. Catholic Church, and numerous miracles are claimed. Vast pilgrimages go there every year from all parts of the world. In recent times a similar phenomenon has been claimed for Fatima in Portugal in 1917, which has also received much publicity, though no official final report has yet been issued. See also MARIALITY. See W. B. Ullathorne, *The Immaculate Conception of the Mother of God*, 1855; J. Northcote, *Mary in the Gospels*, 1885; B. W. Randolph, *The Virgin Birth of Our Lord*, 1903; A. Schaefer and F. Bossart, *The Mother of Jesus in Holy Scripture*, 1913; O. R. Vassall-Phillips, *Mary, Mother of God*, 1927; Canice, O.S.F.S., *Mary*, 1936; and F. Izard, *The Meaning of Lourdes*, 1938.

Mary I. (1516-58), queen of England, the elder daughter of Henry VIII., by his marriage to Catherine of Aragon. Like all the Tudors, she received a good education and was a distinguished linguist and scholar. She was brought up in the faith of the Catholic Church and nothing afterwards would induce her to be unfaithful to her religion. After the divorce of her mother she was treated with harshness by her father, being deprived of her rank and precedence, and made to live in a secluded, restricted manner. After her father's death she lived in retirement until the death of Edward VI. called her, in 1553, to the throne of England. She was the popular choice of the country and easily put down the movement in favour of Lady Jane Grey. The main conspirators were executed, and M. proceeded to



MARY I.

restore the old religion as cautiously as she possibly could, but finally lost her popularity by her marriage to Philip II. of Spain. Wyatt's rebellion was quelled, but Lady Jane Grey and her husband were executed, and even the Princess Elizabeth spent some time in the Tower. In 1554 her marriage with Philip took place and the religion of the country was restored to that of the time of Henry VIII. Then began the period of persecutions which have given M. the title of Bloody M. and the reign the character of one of the blackest of our annals. At least 300 'heretics' were put to death at the stake. Finally, in 1558, M. d., deserted by a husband to whom she had borne no children, and heartbroken by the desolation of her life and by the loss of Calais, the last English possession in France. See J. M. Stone, *History of Mary I.*, 1901; J. A. Froude, *The Reign of Mary Tudor*, 1910; A. F. Pollard, *History of England*, 1847-1903, 1915; H. S. Stinson, *Spanish Marriage*, 1933; and B. White, *Mary Tudor*, 1935.

Mary II. of England (1662-91), elder daughter of James II. of England by his marriage to Anne Hyde, the daughter of

Clarendon, the lord chancellor. She was b. in London, was brought up in the Protestant faith, and was married to her cousin, William of Orange, stadholder of Holland, in 1677. Eleven years later she ascended the throne of England, as joint-sovereign with her husband, after the revolution of 1688. Her husband had a great affection for her, and trusted her with the government of the country during his absences on the Continent and elsewhere. She d. in 1694 of smallpox, leaving no children. See N. M. Waterson, *Mary II*, 1928; and M. Bowen, *The Third Mary Stuart*, 1929.

Mary (Victoria Mary Augusta Louise Olga Pauline Claudine Agnes), queen consort of George V., king of Great Britain, etc., b. May 26, 1867, at Kensington Palace, only daughter of Francis Paul Charles Louis Alexander, duke of Teck. Her mother, Mary Adelaide Wilhelmina Elizabeth, duchess of Teck, was younger daughter of Adolphus Frederick, first duke of Cambridge. Her childhood's home was White Lodge, Richmond, where she studied music under Tosti. From 1883 till 1886 she lived with her parents in Italy, and, until her marriage, was popularly known as Princess May. On Dec. 7, 1891, was pub. her engagement to Prince Albert Victor, duke of Clarence, then second in the succession of heirs to the throne. Feb. 27, 1892, was fixed for the wedding, but the duke of Clarence d. on Jan. 14. On May 3, 1893, was announced her engagement to that duke's younger brother, her future husband—then duke of York—to whom she was married in the Chapel Royal at St. James's Palace on July 6, 1893. She bore him five sons and one daughter (John, the fifth son, d. in 1919). She accompanied her husband, as princess and as queen, in all his important voyages and progresses. Early in the First World War (Aug. 20, 1914) she inaugurated the Queen's Work for Women Fund, which estab. workrooms for women workers displaced by the outbreak of war—until these were absorbed into munition-making and other industries. She also organised Queen Mary's Needlework Guild for the provision of garments for those suffering through the war. In July 1917 she visited the hospitals in France. A popular figure with all classes, she received the sympathy of a large public on the death of King George V. in 1936, after sharing with him the joy of their silver jubilee in the previous year. See lives by C. Cavendish, 1930; Sir G. Arthur, 1935; and L. Wulff, 1949.

Mary of Guise, called also **Mary of Lorraine** (1515-60), daughter of the duke of Guise. She married, in 1534, the duke of Lorraine, who, however, d. in 1535. She next married James V. of Scotland, to whom she bore a daughter, afterwards the famous Mary Queen of Scots. After her husband's death at Solway Moss (1542), she became regent for her week-old daughter. The times in Scotland were troublous, since the Reformation party was struggling against the court party for the recognition of the Reformed religion. Mary attempted to carry out

the ambitions of the Fr. crown in Scotland, but her regency did not last long and she was declared deposed in Oct. 1559.

Mary, Princess Royal, Countess of Harewood, Brit. princess, given the title of princess royal in 1932. Only daughter of King George V. and Queen Mary, she was b. at York Cottage, Sandringham, April 25, 1897, and christened Victoria Alexandra Alice Mary. On Feb. 28, 1922, she married Viscount Lascelles, afterwards sixth earl of Harewood (d. May 24, 1947). Two sons were b.: George Henry Hubert, earl of Harewood, b. Feb. 7, 1923, and Hon. Gerald David Lascelles, b. Aug. 21, 1924. Princess M. is colonel-in-chief of the Royal Corps of Signals, Royal Scots, W. Yorkshire Regiment, and Royal Canadian Signals, and controller-commandant of the Women's Royal Army Corps.

Mary Queen of Scots (1542-87), daughter of James V. of Scotland by his marriage



MARY QUEEN OF SCOTS

to his second wife Mary of Guise, b. at Linlithgow. She was b. immediately after the disastrous defeat at Solway Moss (1542), and was a queen before she was a week old. Her father on his deathbed made the famous and mistaken prophecy, 'It came with a lass, it will go with a lass.' She was promised to Edward VI. as wife, but finally after the battle of Thorne married the dauphin of France, son of Henry II. She was sent to France at an early age, and there her education was completed. She conveyed by the marriage treaty the crown of Scotland to the king of France in the event of her dying childless, and also passed on by the same treaty her right of succession to the Eng. crown. In 1559 her husband became the king of France, but he d. in the following year. Charles IX. succeeded to the throne of France, and the real power passed into the hands of Catherine de' Medici, the queen mother. In the meantime, the death of the queen mother in Scotland, Mary of Guise, had left the gov. without a head and the presence of the young queen was urgently requested, especially since the Reformation had already gripped Scotland very closely. In 1561 she

arrived in Scotland and found that the Reformation had received what it considered to be a parl. sanction for itself. M. did not interfere, in fact for a time she allowed matters to follow their previous course. She allowed the Reformed Church to continue without molestation, but stipulated for a private use of her own faith. Her chief minister, Murray, succeeded in crushing an insurrection of the Catholics under the earl of Huntly in the N., and for a time M. reigned not only in peace but also with the approbation of her subjects. Her attention, however, was next turned to her second marriage. A number of princes were proposed to her. Elizabeth of England quixotically proposing her own favourite, the earl of Leicester. M., however, desired a Sp. marriage, and endeavoured to bring about her marriage with Don Carlos of Spain. It is important to bear in mind the fact that M. was the heiress to the Eng. throne as well as the occupant of the Scottish, and that, therefore, in the eyes of Europe, her position and prospects were magnificent. Failing in her attempt to bring about a marriage with Don Carlos, she suddenly surprised everybody by marrying her cousin Darnley, the nearest heir after her to the throne of England and Scotland.

Darnley was weak in character and insolent in manner; immediately after his marriage he was given the title of king, but was granted but few privileges to accompany the title. He early disgusted M. by his frequent love intrigues, and he in turn, failing seemingly in his attempt to gain his desires and ambitions towards the Scottish crown, began to intrigue in order to bring about these ends. He was jealous of Rizzio, the It. favourite, and the practical minister of M., and conspired with Moray, Ruthven, and Morton to murder him. This was done in Holyrood Palace on the evening of March 9, 1566. M., however, won Darnley from the conspirators, whom he betrayed, and for a time their relations were friendlier. Finally, after the birth of James, their son, afterwards James VI. of Scotland and I. of England, the rupture became complete, and later all Scotland was horrified to learn that the house in which Darnley lay ill of smallpox had been blown up and his body found in the garden of the house. The queen could not be directly accused of complicity, but there were many who believed that she was not altogether guiltless, especially as the chief instigator of the murder had been her new favourite Bothwell. He was brought to trial and acquitted, immediately after which he seized the person of the queen and conveyed her to Dunbar, nominally a prisoner. All Scotland, however, had no doubt of the complicity of M. in the murder and the abduction when she publicly pardoned Bothwell and after he had obtained a divorce married him. An insurrection immediately broke out, and she, deserted by almost all her nobles, was defeated at Carberry, forced to abdicate in favour of her young son, and imprisoned in Loch Leven Castle. From here, in 1568, she

escaped, raised a small army, and was again defeated, at Langside. She fled this time, and placed herself under the protection of Elizabeth of England.

Elizabeth's position was difficult; whilst she could not approve of rebellion against the queen, she equally could not allow M. to escape from her now, since M. was her greatest rival. M., therefore, found herself a prisoner for life. During the next nineteen years she passed from prison to prison in England. She had many supporters in that country, and one long conspiracy was kept up during her imprisonment. One may almost safely say that Elizabeth's position was unsafe as long as M. lived. Finally, in 1586, the conspiracy of Anthony Babington was discovered, and M. was accused of complicity. The whole evidence was based on the authenticity of the Casket Letters. M. denied complicity, as she denied the jurisdiction of the court which tried her. Finally, however, she was found guilty and sentenced to death, and in Feb. 1587 Elizabeth signed the death warrant. She was executed on Feb. 8, and in the eyes of her followers a martyr, protesting her innocence and strong in the faith of the Catholic Church. Buried first of all at Peterborough, her body was in 1612 removed to Westminster Abbey by her son James I. See also CASKET LETTERS. See Lives by D. Hay Fleming, 1897; E. Linklater, 1933; M. Bowen, 1934; S. Zweig (Eng. trans. 1935) and M. P. Willcocks, 1939; also T. B. Henderson, *The Casket Letters and Mary Queen of Scots*, 1889; A. Lang, *The Mystery of Mary Stuart*, 1901, 1904; A. F. Stuart (editor), *Trial*, 1923; M. Baring, *In My End Is My Beginning*, 1931; and Sir E. A. Parry, *The Persecution of Mary Stuart: a Study in Criminology*, 1931.

Mary, Turkestan S.S.R., see MERV.

Maryborough: 1. Or Port Laoughise, a tn. of Eire, cap. of Leix co., is situated on a small trib. of the Barrow, 50 m. S.W. of Dublin. It has sev. good public buildings. It has woollen manufs. and flour mills. The public buildings include a mental hospital and co. infirmary. Pop. 3000. 2. City of March co., Queensland, on the Mary R., 184 m. N. of Brisbane. It is an industrial city, the chief industries being shipbuilding, locomotive and general engineering works, and saw-milling. There are also flour-mills, and butter, sugar, and bacon factories. Bricks and earthenware pipes are also manufactured in the locality, and there are coalfields within 12 m. of the city. M. is centrally situated in the Wide Bay dist., is a railway centre, and has a first-class aerodrome. Pop. 16,000. 3. Tn. of Talbot co., Victoria, 110 m. N.W. of Melbourne. Originally a rich gold-mining area but now an industrial tn., with knitting-mills, flour-mills, small tool and twist drill factory, butter factory, and furniture and joinery factory. The tn. is an important railway junction for four main lines and is surrounded by a dist. devoted to mixed farming. Pop. 6300.

Mary-bud, see CALENDULA.

Maryland, maritime state of the U.S.A.,

Maryland

bounded on the N. by Pennsylvania, W. and S. by W. Virginia and Virginia, and E. by Delaware and the Atlantic; it is known as the Free State. It covers a total area of 10,577 sq. m., of which over 690 sq. m. are water. Chesapeake Bay alone having an area of 1203 sq. m., and lies in three distinct regions, viz. the coastal plain, Piedmont Plateau, and Appalachian Plateau, the last named being traversed by the Alleghany Mts. The most important riv. is the Potomac, which drains the W. portion of the state and forms its S. boundary. Other rvs. are the Susquehanna, Patapsco, Choptank, Sassafras, and Wicomico, all, except the Susquehanna, of which the mouth alone is in the state, being small and comparatively unimportant. The climate varies greatly; in the S. the normal winter is mild and summer hot, whereas in the W. the normal winter is cold and summer cool. The state contains important coal-fields; clay products are also valuable, and sand, talc, lime, and rock cement are obtained. On the whole the soil is well adapted for agriculture and under good cultivation. It is particularly fertile in the W. cos. The chief crops are wheat, maize, hay, potatoes and other vegetables, tobacco, and fruit. Horses, mules, cattle, sheep, and pigs are reared. The fisheries, especially of oysters, are extensive. Steel manuf. and copper smelting and refining are its chief industries; coal, coke, cement, asbestos, and some potash salts are produced. The chief tn. is Baltimore (pop. 1,046,700), but Annapolis (pop. 13,070) is the seat of government. Cumberland (39,500), Hagerstown (32,500), and Frederick (15,900) are other important cities. M. is administered by a senate of twenty-nine members and a house of delegates of 123, both elected for four years, and is represented in Congress by two senators and six representatives. There is an excellent system of free public schools and a number of higher educational institutions, the most important being the Johns Hopkins Univ. (q.v.). The univ. of M. is at Baltimore. Communication by water and land is excellent; there are good roads and over 2000 m. of railway, steam and electric. There are thirty-nine airports. Baltimore, which is one of the best ports on the coast, has a large export trade. Total state pop. 2,215,000, of whom about 17 per cent are Negro.

M. was named after Henrietta Maria, queen consort of Charles I. of England. It was first explored by Capt. John Smith in 1608. A charter granted by Charles I. to Lord Baltimore to found a colony for Rom. Catholic recusants gave him practically royal power over the region. In 1638 the people were conceded the right to initiate legislation. The assembly passed the famous Act of Toleration in 1649 by which freedom of worship was granted to all Christians. This, however, provoked the Puritans to rebellion and in 1652 the colony was seized by the commissioners of Parliament, but was restored to Lord Baltimore in 1657. M. was one of the thirteen original states. See M. P.

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Masai

Andrews, *History of Maryland Province and State*, 1929, and *The Founding of Maryland*, 1934; P. Wilstach, *Tidewater Maryland*, 1931; Federal Writers' Project, *Maryland: a Guide to the Old Line State*, 1940; and D. Cunz, *The Maryland Germans: a History*, 1949.

Marylebone (in full, St. Marylebone, i.e. St. Mary's on the bourn or brook, the brook being the Tyburn), bor. of the co. of London. It lies between Hampstead and Oxford Street, Paddington being on the W. side. It includes the dists. of St. John's Wood, the greater part of Regent's Park, Cavendish and Portman Squares, Harley and Windmill Streets, and the railway stations of M. and Baker Street. It also contains Lord's cricket ground, Bedford College, Queen's Hall (burnt out in a Ger. air raid), and Madame Tussaud's. Much of the land forms the Portland estate, the property of the Lord Howard of Walden. It is a single parl. div., returning one member. Pop. 98,000.

Marylebone Cricket Club, see under CRICKET.

Mary Magdalene, see MAGDALENE.

Maryport, seaport of Cumberland, England, on the Ellen, 28 m. S.W. of Carlisle. So called from the landing here of Mary Queen of Scots on her flight from Scotland. It has shipbuilding yards, iron foundries, tanneries, breweries, etc. The exports consist principally of coal and iron. Pop. 3200.

Marysville: 1. City in Yuba co., California, U.S.A., 43 m. N. of Sacramento. Dredge gold-mining is carried on, and it has an iron foundry, woollen mills, fruit canneries, etc. Pop. 6600. 2. Post vil. of Hastings co., Ontario, Canada, 34 m. W. of Kingston, on the Grand Trunk railway. Pop. 3000.

Masaccio ('shiftless') (1401-28), nickname of Tommaso di Giovanni di Guidi, a Florentine painter, b. in the Arno Valley. He is sometimes called the father of modern art, and is celebrated for his frescoes in the Brancacci chapel in the Carmine and in Santa Maria Novella at Florence, which became a school of instruction for Florentine painters of the succeeding generations. He also painted sev. pictures now in the Berlin Museum, and his 'Madonna and Child with Angels' is in the National Gallery, London.

Masai, people of Hamitic-negroid stock, living in Kenya and other parts of E. Equatorial Africa, speaking a Nilotic language. Up to the early years of this century they occupied considerable part of the large plains which extend from about 1° N. lat. to 6° S. lat., situated in both Brit. E. Africa, and what was formerly Ger. E. Africa (Tanganyika). Those living in Kenya commonly call themselves Il-Masai, while those in Tanganyika are often known as L-Oikop or Il-Lumbwa. But the encroachments of the white settlers on the famous Rift Valley and the high plateaux, where formerly they held fierce and exclusive sway, has for many years threatened them with extinction and already their numbers have been reduced to about 40,000. Sineyew,

thin-lipped, and tall, they are or were of warlike character, but have now for some time lived peacefully under the British regime, and on their own reserves. They are a nomad people, averse to labour for white settlers, and to agriculture, preferring cattle-raising, which they regard as their true source of wealth regardless of the quality of the cattle. The thoughts, ideas, sayings, language, and customs of the M. are recorded in detail in Sir A. C. Hollis's *The Masai: their Language and Folk-lore*, 1905. See also KENYA. See J. W. Gregory, *The Great Rift Valley*, 1896, and Lord Hailey, *An African Survey*, 1938.



MASAI

E.N.A.

Masampo, Korea, former free port of foreign commerce on the S.E. coast, 180 m. S.E. of Seoul.

Masanjiello, see ANIELLO, TOMMASO.

Masaryk, Jan Garrigue (1880-1948), Czech statesman and patriot, b. in Prague, son of Thomas Garrigue M., and educated at Prague. He emigrated to the U.S.A. in 1907, but when the Czech republic was formed in 1918 he entered the ministry of foreign affairs there. Between 1919 and 1922 he was in the diplomatic service in Washington and London, returning to Prague in 1922 as secretary to the foreign ministry. From 1925 to 1938 he was Czech minister to Great Britain, and throughout that time was an outstanding success, witty and shrewd, and a devoted representative of his country, who persistently kept its interests before the British Gov. After the Munich pact, however, he deemed it necessary to conclude his London mission in order to conduct a

lecture tour in America to save, not so much his country's frontiers, as Europe itself. In 1939 he was back in London, where he introduced the first news bulletin in the Czech language to be broadcast from the B.B.C. His national programme was a free Czechoslovakia in a free Europe, and he proved much the most popular and influential broadcaster his country had ever known. In particular he exposed the long-premeditated Nazi plan to extinguish the culture of his nation. In July 1940 he was appointed minister of foreign affairs in the Czechoslovak provisional gov. and in 1941, Deputy Prime Minister as well. After another visit to the U.S.A. for discussions with President Roosevelt he returned to Great Britain in July 1942, where he played a prominent and effective part in the conferences between the various provisional gvs. which had their headquarters in London during the war. In April 1945 he accompanied Benes to Moscow for discussions with Stalin and Molotov. In Aug. of that year he flew to London to take part in the discussions of the U.N.R.R.A. Council, and in the conference of the preparatory committee of the United Nations Organisation. He was uncompromising in his view that the Sudeten Gers. should leave Czechoslovakia, and unwilling to yield to Poland in the long-standing dispute over Teschen. Late in 1946 he was nominated, against Rom. Catholic opposition, as head of the Czechoslovak delegation to the United Nations Assembly. Though by upbringing and inclination he leaned more to the W. than to the E. he strove, after the liberation of his country, to get each side to understand the point of view of the other, as was demonstrated in his address as president of the World Federation of the United Nations Associations at Mariánské Lázně (Marienbad) in Aug. 1947, and if he failed, it was because Prague was again conquered by a harsh and alien system of gov. inspired by Russian communism as opposed to the philosophy of individual freedom. In March 1948 he committed suicide by jumping from the window of his apartment in the Foreign Office, Prague, dying a victim of this conflict. M. was a Czech patriot, for whom patriotism meant a free country, proud of her Slav blood, and of her liberal culture.

Masaryk, Thomas Garrigue (1850-1937), first president and 'liberator' of Czechoslovakia. B. at Hodonín in Moravia. At an early age he was apprenticed to a blacksmith; but, largely owing to his mother's determination, he was enabled to continue his education at school, and at the univ. with a view to becoming a teacher. In 1878 he married Charlotte Garrigue, an Amer., whose name he added to his own, and, until her death in 1923, she was his ardent helper in all his work. He had been a teacher for some time when, in 1879, he was elected *privatdozent* or unsalaried lecturer in philosophy at the univ. of Vienna. In 1882 he became a prof. at the new Bohemian univ. of Prague. In 1891 he entered Parliament in Vienna, but resigned in 1893. In 1907 he returned to

Parliament as a representative of the Realist party. He was an outspoken opponent of Germany's encroachment upon Austria, and more especially of Austria's encroachment upon the Balkans and the policy of annexation in Bosnia. He also succeeded in exposing the forgeries of the Austrian Embassy in Belgrade which were used in the Agram and the Friedjung trials. In 1914, after the outbreak of the First World War, he fled to Italy, and from there and in Switzerland, France, and England carried on a ceaseless propaganda on behalf of the national aspirations of the Czechs and the Slovaks. In London he became a prof. at King's College. Two years later, in 1917, he went to Russia, and then to the U.S.A., where he secured recognition of the Czech National Council, of which he was president. On Nov. 14, 1918, he was elected president of the newly formed republic of Czechoslovakia, being re-elected in 1920 for seven years, and again in 1927 for a further period. On his eighty-first birthday his enthusiastic fellow-countrymen presented him with the sum of 20,000,000 crowns (£122,000), which M. allocated to humanitarian and educational institutions. (See CZECHOSLOVAKIA.) In addition to being one of the most respected statesmen in Europe, M. was a scholar and a renowned realistic philosopher. The following is a select bibliography of his works: *Sobranařda* (1881); *Theorie Pravdopodobnosti a Humeova Skepsi* (*The Theory of Probability and Hume's Scepticism*, 1882); *Blaise Pascal* (1883); *Ceská Otázka* (*The Czech Question*) (1896); *The Philosophy of History and Religion in Russia* (1913); *The New Europe* (1918); *Světová Revoluce* (1925; Eng. trans., *The Making of a State*, 1927). See lives by D. A. Lowrie, 1930; E. Ludwig (Eng. trans. J. Murphy, 1936); R. J. Kemer, 1938; V. Cohen, 1941; P. Selver, 1941; and K. Čapek, *President Masaryk tells His Story*, 1933.

Masaya, tn. of Nicaragua, cap. of the dept. of M., 13 m. W.N.W. of Granada, near the lake, and at the foot of the volcano, both of the same name. Sugar, tobacco, rice, and coffee are produced in the area. Pop. 36,300.

Masbate, one of the Philippine Is., S. of Luzon and W. of Samar. Length 60 m., breadth 20 m., and it covers an area of 1262 sq. m. Gold is found, and it is very fertile, yielding tobacco, gums, resins, etc. The chief tn. is Masbate. Pop. of is. 51,000.

Mascagni, Pietro (1863-1945), It. operatic composer, b. in Leghorn, son of a baker, was educated at Leghorn and at the academy in Milan. His father destined him for the law but, through the interest of a patron, he was enabled to go to the Milan Conservatoire. His success 1849: counterpoint work prompted him to give up study for the job of conductor of a small touring operatic company, an 1852 trade which explains alike his success and failure in life. Later, he settled in Lord H., where he gave pianoforte lessons, of the thronged the local band. Conditions would scarcely have been less

promising for a young musician, but he had written *Guglielmo Ratcliff*, an opera on a gloomy subject of Heine's, set out in an ineffective libretto, and *Caravalla Rusticana*. The latter was chosen in a competition organised by the It. music publisher Sonzogno. The opera was produced on May 1, 1890, at the Costanzi Theatre, Rome, and was an instant success. A vil. tale of passion and jealousy, it is clear and rapid in action, and skilfully portrays simple and strong emotion, with music which, if sometimes commonplace, always reinforces the spirit of a situation. *Caravalla Rusticana* was M.'s first success, and might with little exaggeration be described as his last. Many other operas followed, but he never again approached this initial success. *L'Amico Fritz* (1891), now neglected, deserved a better fate, for there is much in it which is charming. *Pinotta*, composed as early as 1880, was not performed till 1932, when it was produced under M. with what was computed to be the 13,000th performance of *Caravalla Rusticana*. *Guglielmo Ratcliff* was first performed in 1895; it has been revived in more recent years, and is still occasionally given in Italy. His last work was *Nerone*, first given in 1935. His cantata *In Filanda* (1881) created no impression. His other operas are *I. Ranzau* (1892); *Sitrano* (1893); *Zanetto* (1896); *Iris* (1898); *Le Maschere* (1901); *Amica* (1905); *Isabeau* (1916); *Lodoletta* (1917); *Si* (operetta, 1919); and *Il piccolo Marat* (1921). Besides operas, he wrote some occasional works, cantatas, and the incidental music for Hall Caine's *The Eternal City*, produced in London in 1902. Most of his operas are to be heard now and again in Italy, but outside his own country they count for little, partly because early success made him careless, partly because his talent was limited; but nothing can minimise the magnitude of his one outstanding achievement. He became a member of the It. Academy in 1929. See Lives by C. Orsini, 1926; C. Cogo, 1931; E. Mascagni, 1936; and A. Terzi, 1931.

Mascara, tn. of Algeria, 45 m. S.E. of Oran. The former residence of Abd-el-Kader, it was destroyed by the Fr. in 1835, and occupied by them in 1841. It trades in cereals, wine, and oil. Pop. 32,000.

Mascarene Islands, group comprising Mauritius, Réunion, and Rodriguez Is. in the Indian Ocean. Réunion was discovered in 1545 by the Portuguese Mascarenhas, who called the group after himself.

Mas-d'Azil, Le, tn. in dept. of Ariège, France, 12 m. W.S.W. of Pamiers. There is a grotto with prehistoric remains. Pop. about 2000.

Masefield, John Edward (b. 1875), Eng. poet, playwright, novelist, and critic, b. at Liverpool. He went to sea as a boy, in the ship *Conway*, whence the admirable sea scenes in some of his tales. He made many voyages and land journeys, and worked on farms as a gardener, and as a bar-tender in U.S.A. He returned to England and became a journalist, editing the miscellany column of the *Manchester*

Guardian. Later, he settled in Bloomsbury, forming a warm friendship with J. M. Synge. Between 1901 and 1911 he wrote poems, plays, novels, short stories, essays, and criticism, all with moderate success, and was an estab. writer by the time 'The Everlasting Mercy' appeared in the *English Review* (1911). This long narrative poem in octosyllabic couplets, representing the spiritual conversion of a prodigal 'tokened to the devil,' evoked much enthusiasm among the critics. M. was, in fact, a pioneer in the revival of the long narrative poem in England. Other

The Tragedy of Nan was produced in 1909. Opinion is divided on its merits, but at the lowest estimate it is one of the few twentieth-century plays that approach true tragedy. But after 1919, apart from a few experimental performances in London, M.'s new plays got little further than the private theatre in his home at Bour's Hill, Oxford. In *Good Friday* (1916) and *The Trial of Jesus* (1925), alternative versions of the same gospel incidents, he crammed himself in the effort to adhere to the scriptural record. There is a real element of dramatic and psychological interest in his portrayal of Pilate and Herod and others, but these religious plays would seem to suffer from the handicap of a static central figure. Among his energetic and thrilling novels are *Jim Dorus* (1911); *Surd Harker* (1924); *Odlaa* (1926); *The Bird of Dawn* (a swift-moving story of the tea-clippers, 1933); *The Taking of Grey* (1934); *The Country Scene* (1937); and *Bardon Parchments* (1947). His miscellaneous works include studies of Shakespeare (1911); *Synge* (1915); and *Ruskin* (1920); the well-known war books *Gallipoli* (1916), *The Old Front Line* (1917), and *Nine Days' Wonder* (1941, about Dunkirk); and a standard work on *Sea Life in Nelson's Time* (1905). M. succeeded Bridges in 1930 as poet laureate, and was awarded the O.M. in 1935; he became the chairman of the National Book League (q.v.).

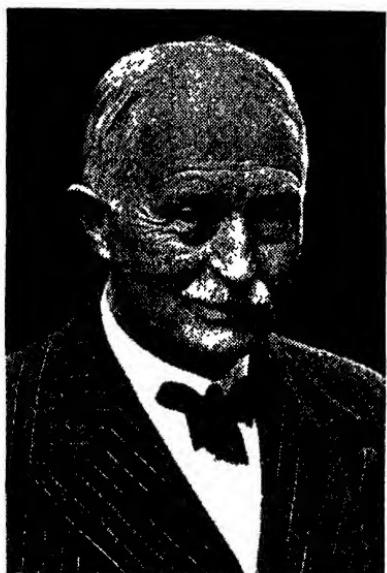
Maseru, dist. of Basutoland. Chief tn. and settlement of the dist. is M., 100 m. N.N.E. of Aliwal N. It links with the Bloemfontein-Natal railway at Maresilles. Pop. 2300.

Masham, see PROVERBS, BOOK OF.

Masham, Abigail (d. 1734), was daughter of Francis Hill, a merchant of London, who married the sister of Mr. Jennings, the father of the duchess of Marlborough. Her relative, then Lady Churchill, procured her the place of waiting-maid to the Princess Anne. She retained her situation after the princess ascended the throne and acquired great influence over her. Miss Hill married Samuel Masham (son of Sir Francis Masham, of Ottes in Essex) in 1707. Harley, afterwards earl of Oxford, connected himself with the new favourite; a change of ministry took place, and in 1711 Masham was raised to the peerage. He and his wife appear to have engaged in intrigues in favour of the Stuarts. See W. S. Churchill, *Marlborough: his Life and Times*, 1933-38.

Masham, small tn. in the N. Riding of Yorkshire, England, 8 m. N.W. of Ripon, on the R. Ure. There is an eighteenth-century grammar school. The main industries are brewing and trade in agriculture. Pop. 2000.

Mashonaland, region of S. Rhodesia, came under Brit. rule in 1890. The chief inhab. tribes are the Mashonas, a peace-loving people. Our earliest information of the country records the settlement of the Bantu Negroes, in the sixteenth century, whose hereditary chief, Monomatapa, had his cap. in M. The people appear to have entered into a commercial treaty with the



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such poems are *The Widow in the Bye Street* (1912), *The Daffodil Fields* (1913), and *Dauber* (1913), all somewhat marred by the artificiality of manufactured rhymes and effort at ultra-realism as expressed in the crude language and occasional blasphemous sentiments in the mouths of characters who, in ordinary life, would no doubt express themselves in that manner. *Dauber*, however, is relieved by some magnificent passages of sea verse. *Reynard the Fox* (1919), also a narrative poem, the record of a fox-hunt, is notable for its truly Chaucerian vignettes of human character. M.'s sea experiences have been a great source of inspiration to him, from his first vol. *Salt-Water Ballads* (1902), onwards. His versatility is shown in his felicitous lyrics and other short poems, in *Ballads* (1903); *Lollingdon Downs* (1917); *Sonnets of Good Cheer* (1926), and in his dramas and novels.

Portuguese. But through a succession of tribal wars they lost cohesion. The next we hear is of the Matabele, an offshoot of the Zulus, whose chief, Mpsitikatga, entered into a treaty with the governor of Cape Colony. From about 1816 to 1870 the Matabele power held sway over the Mashonas and other Makalanga tribes. A pioneer force was sent into M. under Colonel Pennefather, and settled on the sites which are now the tns. of Salisbury, Victoria, and Charter. A dispute with the Portuguese, who claimed a tract of ter., was settled by force of arms, in which the Brit. S. African police were the victors. The Matabele resented Brit. occupation, with the result that Dr. Jameson, Major Forbes, and Allan Wilson raided their native kraals. Wilson and his force were slain as the result of the Shangani R. rising and preventing reinforcement. Lobengula, their chief, d. in 1894, thus quelling for a while the Matabele spirit. They and the Mashonas revolted, however, in 1896, but their resistance gave way in 1897. Industrious and generally peaceful, the Mashonas make very successful farmers. They excel in the crafts, the smelting and forging of iron, in pottery, and weaving. They are good hunters, fond of music, and use the bow and arrow, assegai, and axe. They were anciently supposed to be the builders of the ruins of Zimbabwe, which show that a large pop. at one time inhabited S. Rhodesia. Legend has it that Solomon got his gold from this region, and that M. is the biblical land of Ophir, but there is no continuous goldfield anywhere in Rhodesia as on the Witwatersrand. The pioneers, under licence from the Brit. S. Africa Company who constituted the first expedition to M., had been promised fifteen gold claims apiece, and were soon occupied in prospecting near the anct. workings, without, however, finding a goldfield of any considerable importance. Sev. potentially good dists. in the S.E. and N.W. of M. have, however, been neglected owing to their remoteness from the railways. In general the deposits are widely scattered, and many are small and easily worked, conditions that favour the individual miner but do not attract the large corporation. M. is no longer a political div., but with Matabeleland forms S. Rhodesia (q.v.). Pop. probably about 400,000, but separate census figures for M. and Matabeleland are not now pub. See J. T. Bent, *Ruined Cities of Mashonaland*, 1892, and C. Bullock, *The Mashona* (the indigenous tribes of S. Rhodesia), 1927; also Bishop Knight-Bruce, *Gold and the Gospel in Mashonaland*, 1888, ed. by C. E. Fripp and V. W. Hiller, 1949.

Maside, com. in prov. of Orense, Spain, 10 m. N.W. of Orense. Pop. about 6500.

Masinissa, or **Massinissa** (c. 238-149 B.C.), king of the Numidians, ruler of the Massylians in E. Numidia, and later king of Numidia. He fought in the second Punic war, first as an ally of the Carthaginians, and afterwards of the Romans, when he served with Scipio against Syphax (204-203) and in 202 at the battle of Zama. He

reigned till 118 B.C., and was given most of Syphax's ter. after the conquest of Carthage, thus becoming ruler of all Numidia.

Mask, name given to artificial covering for the face for the purpose of disguising or protecting the wearer. The making of Ms. representing human, animal, or grotesque faces dates back to prehistoric times, and the use of the M. in ceremonial dances, incantation ceremonies, or other ritualistic occasions survives among primitive peoples down to the present day. The M. was believed to have a diabolical power which transferred to the wearer the attributes of the character represented, its purpose being either to create an illusion in the beholders or to give courage to the wearer, frightening evil spirits and enabling him to conquer his enemies, or to propitiate his gods. There exist African, Melanesian, and Polynesian Ms. which owe their origin to this urge among primitive peoples to identify themselves with the objects of their veneration. Knowledge of the M. in Europe begins with its use in the theatre of the anct. Gks. It doubtless had its origin in the early mystery cults, but in the Gk. and later the Rom. theatre it survived as a representational convention. In China, Japan, and the Far E. the theatrical Ms. had the same uses but retained more of their magical qualities. In the Middle Ages in Europe Ms. were made with a Christian significance but not primarily to be worn. In the sixteenth century the M. gained a new vitality through the *Commedia dell' Arte*, and from this developed the Venetian social M., simply a covering for the eyes and nose, leaving the mouth free. It signified licence from social restraint and to that extent retained some its primitive magical character. The M. is also a means of preserving a likeness of the features of a person once living, and in this connection, too, it has a long hist. The anct. Egyptians made death masks of thin gold plate. The Romans used wax. Later methods are to apply oil or grease to the face, and then coat the features with plaster of Paris, which hardens and can be removed to form a mould from which the M. can be cast. Ms. are also used in modern industry as a protection to the face, necessary in various processes such as, for instance, oxy-acetylene welding. The use of poison gas as a weapon in the First World War resulted in the invention of the gas M. or respirator.

Maskelyne, John Nevil (1839-1917), Brit. illusionist, b. at Cheltenham; apprenticed to a watchmaker. Began his entertaining at the age of sixteen. In 1865 he exposed the Davenport brother 'spirit-speaking' séances showing that they used watch-spring devices. In 1873 he moved to London, where he founded and toured with an illusionist show. Performed at Crystal Palace, 1867; Egyptian Hall (London), 1873; royal command performance, 1879; world tour, 1881; in partnership, later, with David Devant (q.v.). He rebuilt and opened St. George's Hall (London) in 1904 for illusionist displays and was founder and first president of the Magic Circle. Shortly after that

time M. and Devant had become the most famous illusionist show in the world. John Nevil M.'s son, Nevil (1871-1926) introduced new disappearing and other illusions, and, during the First World War, carried out experiments in photographing and timing artillery shells in flight, and put at the Admiralty's disposal a fire-resisting formula which was later used by naval gunners. He also supplied illusionists who performed 'magic' for Lawrence of Arabia before Arab chieftains. His son, Jasper (b. 1903) carried on the business, his first public appearance in a royal command performance being in 1912 and his first world tour 1930. St. George's Hall was sold to the B.B.C. in 1933, following his second royal command performance in 1932.



NEVIL MASKELYNE

Maskelyne, Nevil (1732-1811), Eng. astronomer, graduated at Trinity College, Cambridge, in 1754. In 1755 he took orders, but he had previously been led to turn his attention to astronomy by the solar eclipse of 1748. In 1761 he went to St. Helena to observe the transit of Venus, and to detect, if possible, the parallax of the fixed stars. In 1764 he acquired that knowledge of nautical astronomy which led to the formation of the *Nautical Almanac*. In 1765 he was appointed astronomer royal.

Maskinongy, see under PIKE.

Mask Lough, lake in Eire, about 11 m. long by 3 m. broad, forming a portion of the boundary of Mayo and Galway cos. and remarkable for its beautiful scenery.

Mason, Alfred Edward Woodley (1865-1948), Eng. novelist, educated at Dulwich and Trinity College, Oxford, where he was president of the union and took honours in classics. Joining Sir Frank Benson's company, he appeared in Shaw's *Arms and the Man*, but soon gave up the stage. He became a Conservative political agent and also occupied himself with church work. He produced his first novel, *A Romance of Westdale* (which he afterwards suppressed) in 1895 and, in

1896, was very successful with his second, *The Courtship of Morrice Buckler*. In 1902 came his best-known novel, *The Four Feathers*, written in a vein of heroic adventure in a contemporary setting. Meanwhile M. stood for Parliament in the Liberal interest and was elected (1906) for Coventry; but, though he seems to have made a good impression with his first speech, he did not stand again. His novel *The Turnstile* (1912) describes the effect of the House of Commons on those who become members. Among other novels of his earlier years were *Running Water* (1907), which contains a famous account of the old Bronze Church on Mont Blanc, *The Broken Road* (1907), for the background of which latter book he had spent some time in India, and *At the Villa Rose* (1910), the first novels in which appeared his highly popular character Inspector Hanau of the Paris Sûreté. He served in the First World War in the Royal Marine Light Infantry and as a naval intelligence officer. Among the many novels he wrote in the next thirty years are *The Summons* (1920); *The Winding Stair* (with a Moroccan setting, 1923); *The House of the Arrow* (1924), and *The Prisoner in the Opal* (1929), in both of which Hanau appears; *No Other Tiger* (1927); *The Dean's Elbow* (1930); *Fire over England* (1936, a story of Armada days, stirring and spectacular); *Königsmark* (1938); *Musk and Amber* (1942); and *The House in Lordship Lane* (1946, a Hanau novel). M. dramatised several of his novels; his comedy, *Colonel Smith*, was produced in 1909.

Mason, George Heming (1818-72), Eng. painter, spent some years in Rome, and whilst in that city painted his 'Ploughing in the Campagna.' His finest paintings are 'The Evening Hymn' (1868) and 'Harvest Moon' (1872).

Mason, James Murray (1798-1871), Amer. political leader, b. in Fairfax co., Virginia. He was a member of the National House of Representatives, 1837-1839, and the U.S. Senate, 1847-61, when he resigned with other S. senators. Appointed confederate commissioner to Great Britain, he was seized with John Slidell on board the Brit. ship *Trent* by Capt. Wilkes of the *San Jacinto*. Great Britain demanded his release, and war was imminent, but Lincoln recognised that the *Trent* was a neutral ship, and released the commissioners. M. was not officially recognised in Great Britain. He lived at Paris and in Canada, returning to the States in 1869. See life by his daughter, Virginia Mason, 1903.

Mason, John (1586-1635), governor of Newfoundland in 1606. In 1622 he obtained grants in Mariana (now N. Massachusetts) and the prov. of Maine, and in 1629 in New Hampshire and Lacoona.

Mason, William (c. 1724-97), Eng. poet, attended St. John's College, Cambridge. From 1751 he held various livings in the Church. He was a profound admirer of Gray, who praised his dull classical tragedy *Caractacus* (1759), but pointed out also his plagiarisms and his grammatical

and other blunders. M. ed. the *Life and Letters of Gray* (1774). See J. Mitford (ed.), *The Correspondence of Thomas Gray and William Mason*, 1853; J. W. Draper, *William Mason: a Study in 18th Century Culture*, 1924.

Mason and Dixon's Line, boundary line (lat. $39^{\circ} 43' 26\frac{3}{4}'$ N.) separating Maryland from Pennsylvania. Charles Mason and Jeremiah Dixon were two Eng. astronomers who surveyed it between 1763 and 1767, and thus put an end to the disputes between the Baltimores and Penns, the respective proprietors of the two colonies. This line was part of the boundary between free and slave (N. and S.) states. Since 1820 it has been a popular name for the whole of that boundary.

Mason City, cap. of Cerro Gordo co., Iowa, U.S.A., 115 m. N.N.E. of Des Moines. Its chief manufus. are bricks, cement and tiles. It has also foundries and machine shops. Pop. 27,000.

Masonry, art of building in stone in a similar manner to building in brick; the fundamental difference between M. and brickwork (q.v.) being that in the former the stones are often of irregular and heterogeneous shape and size, as opposed to the uniform mass of bricks. This renders it difficult to obtain a bond in the work, as well as causing the walls to be thicker than brick walls. M., however, from these features, is better suited to imposing and beautiful structures, as work of greater projection can be included than is possible with brickwork. The art of M. is of great antiquity, the pyramids of Egypt being perhaps the most noteworthy examples in the world of M. without mortar.

The tools which a mason uses include squares, hammers of various shapes, 'boasters,' chisels, saws, axes, picks, wedges, trammel heads, for setting off distances, nippers for lifting the stones, etc.

Building stone after being quarried is left exposed to the air for a period to season. The manner in which stones are treated either before or after building is described in various technical terms. Scrapping is taking off the salient angular projections of the stone; when the stone is used in this condition the work is called rustic work. Hammer-dressing and half-sawing are terms which explain themselves. Half-plain work is the term applied to stone which has been roughly levelled, whilst plain work has been more accurately smoothed. Combed work has been treated by a steel scraper or comb; boasted or droned work has parallel chisel marks, which do not extend quite across the surface, as in tooled work. Sunk work is below the level of the surrounding stone, moulded work is work formed with a change of curvature, whilst chisel-draughted margins are smooth narrow spaces enclosing combed, boasted, or plain work. Rubbed work is rubbed with another stone and with sand, water, etc., whilst polished work is brought to a high polish generally by machinery. Most building stones are composed of layers or

laminations, and it is of the utmost importance when using them that they are correctly bedded. In the case of stones resisting heavy compressive forces, the lamination must be at right angles to the thrust, otherwise there is a tendency for the surface to peel off. All joints in M. must be at right-angles to the pressure which they have to bear. Joints between two blocks of stone are formed by dowels, cramps, and various types of joggles. Great care must be taken to prevent the formation of rust when using iron for securing joints, because the consequent expansion is capable of splitting the stone.

Stone walls may be divided into three main classes, according to the manner in which the stones are set up: rubble, block in course, and ashlar. The first category includes a great variety of methods, of which the chief are known as flint; random rubble set dry; random rubble set in mortar; Kentish rag; random rubble built in courses; uncoursed; squared or 'snecked' rubble built up to courses, and regular coursed rubble. 'Rubble' as a generic term means thinly bedded stone, generally taken as less than 9 in. in depth. When it is of irregular shape it is 'random,' and when squared into shape it is said to be coursed. The various kinds of rubble walls thus explain their composition by their names. In random rubble set in mortar the bond is obtained by using one bond stone in every superficial yard in the face. In flint work, windows and door dressings and groins are set with brick or squared stone for strength and appearance. 'Kentish rag' is built of a kind of unstratified sandstone which is found in Kent, and the blocks of which are usually roughly dressed to a polygonal form. 'Snecks' are small stones which are inserted where required in snecked rubble to prevent long vertical joints. Block in course work is made of stones larger than those used for coursed rubble, with hammer-dressed faces, squared and brought to a good joint; it resembles good coursed rubble or ashlar, and is very strong and durable. Ashlar is the name given to carefully worked stones of more than 12 in.; owing to its heavy cost ashlar is backed either by brickwork or by rubble. The backing should be built in cement mortar and brought to a level at every bed-joint of the ashlar. The facing of the ashlar may be plain, rebated, or chamfered. See W. R. Purchase, *Practical Masonry*, 1904; and C. C. Williams, *The Design of Masonry Structures and Foundations*, 1922; E. Warland, *Modern Practical Masonry*, 1929; T. Corkhill (ed.), *Brickwork, Concrete, and Masonry*, 1931.

Masonry, Free, see FREEMASONRY.

Masons' Marks, as used in medieval buildings, were devices cut in the stones to identify the responsible mason or master-mason. Their origin, however, may conceivably be traced to early Rom. times. A series of marks has been found on buildings of the regal period, particularly those on the stone of the upper wall and the marks of the *celfa* or granaries on the Palatine near the Scalae Caci (one of the three approaches to the anc. city). They

are deeply cut, generally on the end of the quarried blocks, and average a foot long. They take the form of single letters, monograms, or numbers. M. M. are found in the Old World in widely distant regions wherever hist. shows that there have been building operations on a large scale. They bear so close a mutual resemblance despite their diversity of location that the palaeographer H. K. Brugsch suggested that the stones in the quarries were marked according to a definite system, and that the old craft-guilds of stonemasons possessed a cryptic alphabet which was handed down to the seventeenth century. A study of eccles. architecture in Britain shows that some master masons identified themselves with their work as, for example by a symbolical device representing their names; see e.g., YEVERLE, HENRY DE.

Maspero, Sir Gaston Camille Charles (1846-1916), Fr. Egyptologist; b. in Paris, entered the Ecole Normale Supérieure of Paris in 1865, and became lecturer on Egyptian archaeology at the Ecole des Hautes Etudes in 1869. For many years he was a prof. at the Collège de France. He discovered many royal sarcophagi at Deir-el-Bahari and made further discoveries in clearing the temple of Karnak. His most valuable pub. is *Histoire ancienne des peuples de l'Orient classique* (1891-1900).

Masque was a species of dramatic entertainment which reached its highest popularity in the reign of James I., but which was also a favourite diversion at the courts of Henry VIII. and Elizabeth. 'Essential masque,' says the Rev. Ronald Bayne, 'was the appeal of the moment to the eye and the ear, the blaze of colour and light, the mist of perfume, the succession of rapidly changing scenes and tableaux, crowded with wonderful and beautiful figures.' Many look to Italy for the origin of the M., but it seems at least likely that it grew out of the 'mummings' which are heard of in England as early as 1377. The growth of opera accounts for the speedy waning of the M.: in the latter, pageantry and spectacular display were of supreme importance, whilst in the former these were rightly subordinated first of all to music and then also to character-drawing and plot. Ms. were played commonly before royalty and in the homes of nobility. Thus Daniel's *Visions of the Twelve Goddesses* was produced at Hampton Court in 1604, shortly after James's accession--when, be it noted, Queen Anne and her ladies were the masquers and *The Masque of Queens* of Ben Jonson was presented at Whitehall in 1609. The *Hymenæi*, also by Jonson, was performed in 1606 to celebrate the marriage of Essex with Frances Howard, whilst his *Pleasure Reconciled to Virtue* was played at court on Twelfth Night in 1618. It was this libretto of Jonson, the great master of the literary M., which inspired Milton's *Comus*, a composition better described as a pastoral than a M., as there is no dancing nor disguise. Inigo Jones often designed the scenery, dresses, and mechanical contrivances; such composers as Lanier¹ and Ferrabosco con-

tributed the music, and the dances were specially arranged by profs. of the art. Money, time, and thought were freely lavished, the sole aim of the inventor being to multiply his gorgeous effects, and to make the spectacle as full and varied as he could. See H. A. Evans (ed.), *English Masques*, 1897; W. W. Greg, *List of Masques, Pageants, etc.*, 1902; E. K. Chambers, *The Elizabethan Stage*, vol. iv., 1923; M. S. Steel, *Plays and Masques at Court, 1558-1642*, 1926; E. Welsford, *The Court Masque*, 1927; and A. Nicoll, *Masques, Mimes, etc.*, 1931.

Masquerade, festive gathering, the participants in which all assume some disguise. The name suggests that when Ms. first came into vogue the mask was a necessary part of the disguise. Weekly suggests an origin (Arabic *maschara*, hunting-stock) different from that of mask, masque. Ms. first appeared in England in the reign of Henry VIII.; they were introduced into France by Catherine de' Medici. Fancy-dress balls, are, it would seem, their modern development.

Mass, term used in physics to denote the quantity of matter in a body. Weight (*q.v.*), with which it should not be confused, is proportional to M. See ACCELERATION; DYNAMICS; GRAVITATION; INERTIA; WEIGHT.

Mass (Lat. *missa*) is the name for the eucharistic service of the Rom. Catholic Church in the W., and corresponds to the term liturgy in the E. churches. The name originated in the words *Ite missa est* (Go, it is ended) with which the rite concluded, the word *missa* coming to mean dismissed and finally becoming the name of the rite itself. The Eucharist was originally performed in Gk. even in the W. including Rome, but Lat. came in in the third century. In the first ages there was no doubt considerable variety of detail in the order of the service, and documentary evidence is not sufficient to establish if there was one rite, and what it was. Universally however was the eucharistic anaphora or prayer by which the bread and wine were changed into the body and blood of Christ, and in which Christ was offered up to God the Father as a victim in renewal of the sacrifice on Calvary. This prayer or canon was preceded by prayers, psalms, and readings from sacred scripture, forming almost a separate service, modelled on that of the synagogue. The first part came to be called the M. of the Catechumens, as the non-baptised were present at it; then they withdrew, and there followed the M. of the Faithful or Eucharist proper. The main rites were the bringing up of the bread and wine by the faithful to the celebrant, the consecration of these elements, and the communion of the faithful. Of the early fathers Justin Martyr (*Apol.* i. 65, 66) gives the fullest account of these rites. After the peace of Constantine began the era of church building and greater freedom for the Church. Solemn chants were introduced, the introit for the processional entry, the *Kyrie* or litany of supplication (still in Gk.) at the beginning,

the hymn *Gloria in ecclesiis*, and a good deal later the singing of the Nicene creed. Chants were devised to cover the time spent in bringing up the offerings (offertory) and in communicating (communion). The *Sanctus* chant marked the beginning of the canon, and the *Agnus Dei* (about 700 A.D.) filled the time taken up in breaking the bread before communion. To-day the old form of the rite is best seen when performed pontifically, i.e. by a bishop or abbot. This is relatively rare in the Rom. Church. In a High M. the celebrant is assisted by a deacon and sub-deacon, whose especial functions are the chanting of the gospel and epistle respectively. It is always sung, with the choir taking up their parts much in the ant. manner. The Low M. is one in which the priest recites the whole text, being answered only by a server; in a variety of this known as the dialogue M. the whole congregation recites the responses. The original music of the M. is known as plain-song or Gregorian chant from Pope Gregory I. (590-604), who did much to organise it and settle its distribution, etc., though how much is not clear. Later ages introduced polyphonic music, Palestrina's *Missa Papæ Marcelli* being particularly famous. The introduction of instrumental music and the development of solo singing in Italy and elsewhere marked a deterioration in the style of the M. as a religious service, and the Ms. of the eighteenth- and early nineteenth-century Catholic composers (e.g. Haydn, Mozart, Weber, and Schubert) though musically effective have not the devotional qualities of the earlier chant. In recent years the Catholic Church has tried to exclude ornate and instrumental music and to revert for devotional reasons to Gregorian chant and the simpler forms of polyphonic music. See J. O'Brien, *History of the Mass*, 1879; F. Cabrol, *Origines liturgiques*, 1906; A. Fortescue, *The Mass: a Study of the Roman Liturgy*, 1912; G. Dix, *The Shape of the Liturgy*, 1943; I. Schuster, *Sacramentary*, vol. 1 (Eng. trans., 1924); J. Norman, *Handbook to the Liturgy*, S.P.C.K., 1944.

Massa, joint cap. with Carrara of the prov. of M. e Carrara, Italy, 28 m. N.W. of Pisa, near the gulf of Genoa. It is here that the Carrara marble quarries are, and silk is also manufactured. Much damage was done to the town, chiefly by heavy shell fire, in the Second World War. The cathedral was badly damaged, and many other churches were hit more or less severely, notably S. Giovanni Decollato, the Carmine, and the Chiesa della Misericordia, besides the convent of Ortola, the castello Malaspina and the ducal palace, which was devastated by shell fire, and its interior wrecked. Pop. 44,800.

Massachusetts, one of the thirteen original states of U.S.A., often called the Bay State, Bean State, or Old Colony State. It is in the N.E. in New England, and has an area of 8257 sq. m., including 350 sq. m. of inland water. It has a fine rocky coast with many bays, the largest being Buzzard's Bay, Cape Cod Bay, and Boston Bay and Harbor. Its area includes two large isls., Nantucket and

Martha's Vineyard, which lie S. of the curiously shaped promontory of Cape Cod. Inland the country rises gradually to the beautiful Berkshire hills, a favourite summer resort, and numerous small lakes are a marked feature of the landscape. The chief rivs. are the Merrimac and Connecticut. The climate is temperate, and the beauty of the spring and autumn in M. is notable. Agriculture was, in the first part of the last century, the primary industry, but in the middle and latter part a great tide of emigration towards the W. states took place. There are still many farms, however (comprising over 2,000,000 ac.), hay, maize, potatoes, tobacco, and onions being grown, and fruit farms, which produce chiefly apples and cranberries. To-day M. is essentially a manufacturing state, the textile and boot and shoe industries being of prior importance; but a large trade is done in paper manufacturing and sugar-refining. There is a cod-fishing industry, centred at Gloucester. Boston (pop. 766,400), a great seaport and the oldest in America, is the cap. Other tns. are Worcester, Springfield, Lowell, centre of cotton industry; Plymouth, where the Pilgrim Fathers landed (1620); and Fall R., a large seaport on Mt. Hope Bay, 50 m. from Boston.

The Puritan ancestry had a marked effect on the inhab. of this state, but waned because of the large influx of Irish, It., and Fr.-Canadian settlers. In its early days it was remarkable for its extreme religious intolerance, and later the great Unitarian movement made its headquarters in Boston. There are over 2000 m. of steam and electric railway in the state; the New York, New Haven, and Hartford railway follows the coast-line, and connects with the New York railway systems. The Boston S. railway terminus is one of the largest railway termini in the world. There are sixty airports, of which fifteen are municipal. The educational system includes Harvard (12,000 students) and Boston (17,800) univs., the M. Institute of Technology (founded in 1861) at Cambridge, and Wellesley College for women students at Wellesley, near Boston.

Its legislative body, the General Court of M., consists of a Senate of forty members, elected biennially, and a House of Representatives of 240. Two senators and fourteen representatives are sent to Congress. Pop. 4,725,000.

M. derives its name from an Indian tribe. The first permanent settlement was made by the Pilgrims from Holland, at Plymouth, in Dec. 1620. In 1628 a few settlers at Salem were joined by John Endicott and some colonists, and a charter was granted by Charles I. The charter was taken away in 1684, but a new one was granted in 1691, which united, under the name of M. Bay, New Plymouth, Maine, Acadia, or Nova Scotia, and M. Bay; in 1783 Nova Scotia remained in the possession of the Eng. M. took a leading part in the War of Independence. See J. S. Barry, *History of Massachusetts*, 1857; L. A. Frothingham, *Brief History of Constitution and Government of Massachusetts*, 1925; A. B. Hart, *Commonwealth*

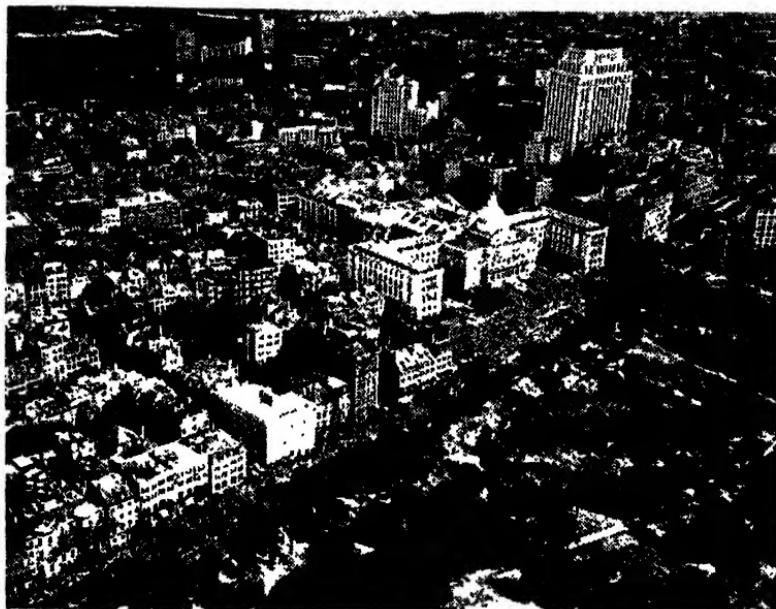
History of Massachusetts, 1928; and Federal Writers' Project, *Massachusetts: a Guide to its Places and People*, 1937.

Massachusetts, N. Amer. aborigines, members of the Algonquin family. The original inhab. of the state which bears their name. Only a small remnant remains.

Massacre of St. Bartholomew, see BARTHOLOMEW, MASSACRE OF ST.

ailments such as sciatica, neuritis, neuralgia, in insomnia, and after fracture of a limb. The other forms of M. in general use are effleurage, stroking, petrissage, frictions, and tapotement.

Effleurage is a form of stroking performed so that the motion is always directed towards the heart. Superficial effleurage relieves pain; deep effleurage is stimulating, promotes circulation and



U.S. Information Service: American Embassy

BOSTON

Parts of the city's industrial and business section. The building with the dome in the right centre is the State House of the Commonwealth of Massachusetts. The waterfront is at the top of the picture.

Massafra, tn. in the prov. of Lecce, Italy, 10 m. N.W. of Taranto. Pop. 12,000.

Massage is a scientific manipulative treatment applied to the softer body tissues in certain diseases and convalescence, when the usual innumerable movements of the body exciting tissue metabolism are in abeyance or impossible. The operator (passer, masseur, massuseuse) placing the patient in suitable positions, proceeds to aid movements of the limbs and joints; to stroke, pinch, press, knead the muscles. By this means the small muscles, cell tissue of all kinds, capillaries, etc., are agitated, and normal waste and repair of the healthy body promoted. A modern extension is the application of vibration, especially to joints in cases of rheumatoid affections, by mechanical or electric vibrators. The treatment has become usual in nervous

tissue nutrition, and counteracts inflammation.

Stroking is applied in the opposite direction, and by different movements from effleurage, and should have a soothing effect.

Petrissage consists of kneading, wringing, and picking up tissues. The last operation is used to reduce obesity, and the two former ones in the treatment of muscles of the limbs. In addition to beneficial effects similar to those of effleurage, petrissage aids the elimination of waste matter from the muscles.

Frictions are circular movements used especially to remove thickenings and adhesions, to reduce inflammation, and to help fat absorption.

Tapotement, sometimes called percussion, consists of hacking, clapping, beating, and pounding the tissues. It aids muscular contraction and metabolism,

and stimulates the skin. Hacking is beneficial in nervous affections.

Vibrations, performed manually or by vibratory mechanisms, are used in the treatment of painful nervous diseases, such as neuritis and neuralgia.

In addition to sprains, muscular weakness, obesity, contusions, and other ailments commonly treated by M., constipation, indigestion, gastritis, and other disorders of the alimentary canal may similarly be relieved. The cause of the disorder, however, must be considered; when it has arisen as a result of irregular habits M. may be particularly helpful. M. has always been used by athletes, and was in regular use among the Gks. Recently it has been employed in conjunction with carefully regulated series of exercises performed by the patient, as a means of rehabilitation, e.g. after war injuries.

Certified masseurs have to undergo a long training at schools of M., usually connected with some great hospital. Degrees are granted by the Chartered Society of M. and Medical Gymnasts. In physiology, anatomy, and pathology the masseur's training is similar to that of a medical student; in addition he is taught the technique of M., including the science of remedial exercises. The chartered society has a register of qualified practitioners.

See J. Arvedson, *Medical Gymnastics and Massage in General Practice*, 1926; B. M. Copetstone, *Theory and Practice of Massage*, 1927 (6th ed. 1942); and M. V. Lace, *Massage and Medical Gymnastics*, 3rd ed., 1945.

Massagetae, warlike people of Central Asia, N. of the Jaxartes (the Araxes of Herodotus) and the sea of Aral. It was in an expedition against them that Cyrus the Great was defeated and slain.

Massa Lombarda, vil. 18½ m. W. of Ravenna, Italy. The walls and roof of the par. church were partly demolished in the Second World War. Pop. 4000.

Massa-Marettima, small cathedral city, 27½ m. S.W. of Siena, in the prov. of Grosseto, Italy. Zinc and lignite are mined. It is the port of Massa (q.r.). Pop. 18,000.

Massaua, or Massawa, see MASSOWAH.
Mass Education, term used for any scheme of universal education of the young, but more particularly for any scheme covering the whole people and thus, as in backward countries, involving schemes for the education of the young of both sexes, and of the adolescent and the adult. In this article the term is used chiefly in its latter connotation and as illustrated by M. E. movements in China, Russia, Turkey, the Negro S. of the U.S.A., and Brit. and Dutch colonies. In this wider context the 'curriculum' so to speak, of M. E., especially in its application to colonial communities, may be conceived as including all kinds of activities which promote the progress of the common people. M. E. covers, therefore, not only experimentation in health, agriculture, and rural economics, but the building up of strong units of local gov., sound family

and social life, and those recreational and leisure-time activities without which people can long survive. Surveys of M. E. and of adult literacy campaigns in certain countries provide useful landmarks to guide colonial planning. In three of these countries, Russia, China, and Turkey, the urge for M. E. has come from within, being part of the rising tide of nationalism (q.v.). In the Netherlands E. Indies the M. E. measures have been part of a deliberate gov. policy and superimposed from above. In the Negro S. of the U.S.A. there has been no widespread M. E. movement, but a great deal of experimental community work. India illustrates more clearly than any other area surveyed the close connection between M. E., economic progress, and social development. Sev. attempts have been made in different provs. in India to launch adult education campaigns along the lines of adult literacy, but the results have been disappointing and discouraging. In the Netherlands E. Indies the Desa school system was originally estab. in 1907 to provide M. E. for the vils., and from 1928 to 1938 the expansion of these schools was very marked. One criticism of this system, however, is that the Desa schools are, admittedly, not linked closely enough with indigenous culture and vil. welfare, though, on the other hand, the children who attend them remain in the vils. and do not drift away to the tns. M. E. in China received its main impetus from Sun Yat Sen and has been carried on with outstanding success in spite of twenty years of internal strife culminating in the war with Japan. The Chinese Republic set M. E. in the forefront of its policy and found enthusiastic support in the hundreds of students returned from the U.S.A. and other foreign countries, imbued with ideas of democratic education. Without this leaven of highly trained personnel ready to serve their country in spreading education, it is doubtful whether the movement would have been successful. How far the different agencies in the Chinese movement continue to function in face of the Communist invasion can only be conjectural; but there was, within the Kuomintang areas, a measure of central direction and supervision under the Ministry of Education which, for instance, controlled the text-books as only authorised ones might be used in schools and adult classes. Another co-ordinating element was a widespread agreement on 'priority' in adult education. Literacy is put first in China, but is closely allied with rural economics, agriculture, health measures, citizenship training, and recreation.

In Russia, as in Turkey, plans for M. E. have involved a revision of the entire educational system. As in China, the objective is sought along a number of parallel lines, the gov. education service, the Red Army, and the trade unions. A decree by Stalin in 1936 ordered the removal of illiteracy in all persons under fifty, and ordained that all military conscripts must be literate. Special attention is paid to the training of teachers in

Russia for illiterate and semi-literate adults. There is a definite attempt in Russia to link all M. E., whether of children, adolescents, or adults, with their local environment, whether urb., industrial, collective farm, or rural vil. In the country dists. cottage reading-rooms, people's houses, and red corners supply books, papers, radio, and sometimes travelling cinemas and theatres. In Turkey M. E. involves adult classes as well as schools for children, for education is compulsory, and free, for adults under forty. In recent years classes in agriculture for men and in domestic science for women have been added to the adult education programmes, but priority was given, as in China, to the liquidation of illiteracy.

The situation in the Negro S. of the U.S.A. differs widely from the other areas considered above. It is perhaps nearer to that in some of the Brit. colonies, especially in the W. Indies and E. and W. Africa. There are no comprehensive plans for the education of the Negroes, covering the whole field. In the Negro S., as in most of Africa and parts of the W. Indies, the majority of schools are under church or mission authority, whereas some of the more recent forms of social service, such as the Rural Extension Service and the Civilian Conservation Corps, have been initiated and financed by state funds under the federal gov. The experience in the Negro S. is instructive on several aspects of M. E., especially at its most vital point, the rural community: for however excellent the general plans for co-ordinated M. E. may be, their real test is in the impact they make on each vil. or rural community. The Jeunes system in the Negro S. has in one sense separated school work from general community education, which was left to the rural extension service. The Jeunes teacher was concerned with the school system. The farm demonstration agent, the home demonstration agent, and the public health nurse operated as a team of social workers outside the school system, though sometimes using the school buildings and contacts to reach the parents. A recent trend, especially in experimental work, has been to draw closer the work in the school and that among the adults, and to integrate the curriculum and methods used in both through a revised programme for rural teacher training. The Brit. Gov. has borrowed and used in Africa both ideas and methods in rural education from among those found in the Negro S. of America, the Jeunes rural supervisory teacher being but one illustration of what is owed to Amer. initiative. In the Jeunes type of school, which had its origin in a bequest by Anna T. Jeunes for the training of visiting teachers for Negro schools in America, the Jeunes teacher is given charge of a group of schools, and is expected to stay at each centre for some days and assist the vil. schoolmaster in his work and give friendly advice. See *Mass Education in African Society*, Col. No. 186, H.M.S.O., 1944 (reprinted 1946).

Masséna, André, Duc de Rivoli, Prince d'Essling (1768-1817), Fr. marshal, was a wine merchant's son, b. at Levens, near Nice. In 1775 he joined the Royal-Italian regiment. In 1795 he captured Onglio and drove the Piedmontese from the heights of Saorgio. The following year he enabled Schérer to win the battle of Loano against the Austrians and Sardinians. So brilliant were his successes during the campaign of 1796-97 that Napoleon called him 'l'enfant gâté de la victoire.' From that time onward, till he was repulsed by Wellington in Spain (1810-11), his career was one long, triumphal progress, and honours fell thick and fast upon him. In 1805 he received his marshal's baton. Having assured to Joseph Bonaparte the possession of the Neapolitan crown (1806), he was put in command of the left wing of the 'Grande Armée' in Poland, and was accorded the title of duc de Rivoli for the splendid services he rendered against the Russian foe. His proudest title, that of Prince d'Essling, was given in recognition of his brilliant generalship at Eckmühl, Essling, and Wagram. After his Sp. campaign (1811), the failure of which he attributed with some justice to the insubordination of Ney, Junot, and other of his lieutenants, M. was never again entrusted with any responsible command. Wellington repulsed him at Busaco, and fell back to the lines of Torres Vedras. M. was completely halted, and his lines of communication cut. He retreated in March 1811 into Spain, and an attempted resumption of the offensive was defeated at Fuentes de Oñoro on May 5. See E. Gachot, *Histoire militaire du Masséna*, 1901-13, and P. Sabour, *Massena et sa famille*, 1926.

Massena, tn. 35 m. N.E. of Ogdensburg, St. Lawrence co., New York, U.S.A. The chief industries are connected with flour, lumber, paper, aluminum. Pop. 11,300.

Massenet, Jules Émile Frédéric (1812-1912), Fr. composer; b. at Montaud, near St. Etienne. Studied harmony at the Paris Conservatoire under Bazin and Reber, and composition under Ambroise Thomas, and won the *Prix de Rome* in 1833. He met with some difficulties in obtaining recognition, but the success of *Marie-Magdalene*, a sacred drama or oratorio (1873), opened all doors to him. His originality at first sight is not very striking; yet he created for himself a characteristic style which certainly had its imitators. He delighted in the facile lyrical melodies which won such success with his public, but his very voluptuous music lacks the dignity of Gounod's, by which, however, it was influenced. A number of his orchestral compositions are frequently performed, including, especially, those of a series of five suites called 'Scenes'—*Hungarian Scenes* (1864), *Picturesque Scenes* (1874); *Neopolitan Scenes* (1876), *Fairyland Scenes* (1879), and *Alsatian Scenes* (1881)—composed during travels in Germany and Hungary. He gradually made progress as an operatic composer, producing *The King of Lahore* in 1877; *Herodias* (known as *Salomé* in England) in 1881; *Manon* in 1884—

probably his most popular work; *Werther* in 1892; *Thaïs* in 1894; *Sappho* in 1897; and *Le Jongleur de Notre Dame* in 1902. Of their class *Manon* and *Werther*, with their love-duets and dramatic scenes, are masterpieces. In them M. practises 'the art of half-tints, light and fine, transparent and voluptuous, in which he excels' (Henri Prunières). Mention may also be made of his *Don Quichotte* (1910), which was popularised by Chaliapin's singing of the titular part. Among his song books are *Poème d'avril* and *Poème d'un soir*. He also composed some overtures, a piano concerto, incidental music to plays, and many songs. See lives by A. Soubise, 1912; A. Pongin, 1913; and R. Brancusi (5th ed.), 1930 also J. d'Udine, *L'Art du lied et mélis de Massenet*, 1931.

Massey, Gerald (1828–1907), Eng. poet and mystic, b. near Tring, Hertfordshire. As a boy he worked in a silk factory, but in 1843 he came to London, where he was taken up by Maurice and Kingsley. His first book was pub. in 1851, and this was followed by four others; a selection from these was pub. in 1889, entitled *My Lyrical Life*. Later he wrote and lectured on spiritualism, and produced prose works on the origin of myths and mysteries in *The Book of Beginnings* (1881); *The Natural Genesis* (1883); and *Ancient Egypt: the Light of the World* (1907). He also wrote a book on the sonnets of Shakespeare.

Massey, Vincent (b. 1887), Canadian statesman, educated at St. Andrew's College, Toronto, Toronto Univ., and Balliol College, Oxford. Lecturer in modern hist. in Toronto Univ., and dean of residence, Victoria College, 1913–15. He was appointed minister without portfolio in the dominion Cabinet after the First World War, and in 1925 contested Durham (Liberal). He was member of the Canadian delegation to the Imperial Conference in London, 1926, and honorary Canadian minister to U.S.A., 1926–30; president of the National Liberal Federation of Canada, 1932–35; and high commissioner for Canada in the United Kingdom from 1935 to 1946. On his retirement in 1946 Mr. Mackenzie King (q.v.) paid high tribute to his services in London which, during six years of war, had been carried out 'under arduous, exacting, and often dangerous conditions.' He was made Companion of Honour in 1946, and was chairman of the univ. of Toronto since 1947. Pubs.: *Good Neighbourhood and other Addresses* (1931); *The Sword of Lionheart and other Wartime Speeches* (1943); and *On Being Canadian* (1949).

Massey, William Ferguson (1856–1932), New Zealand statesman, b. at Limavady, Co. Derry, Ireland. He migrated to New Zealand in 1870, and settled as a farmer near Auckland. Entering Parliament in 1894 he was opposition (Conservative) whip from 1895 to 1903, and in 1903 became leader of the Conservative opposition. He was made Prime Minister in 1912, being also minister of lands and labour. In the First World War he became a member of the Imperial War Cabinet (1917–18), his ability and character successfully bringing his country

through the war. He was New Zealand representative at the Paris peace conference in 1919 and, in 1921, New Zealand's chief delegate at the Imperial Conference, London; but his gov. was defeated at the general election of 1922. He was a member of the House of Representatives from 1894 until his death.

Massicot, yellow oxide of lead, the monoxide, PbO , sp. gr. 9·3, occurs native, but generally prepared by heating lead or white lead in air up to about 600°C . It is mostly used in the manuf. of red lead, the dioxide, and as a pigment.

Massillon, Jean Baptiste (1663–1742), Fr. bishop, b. at Hyères, near Toulon, joined the congregation of the Oratory, and after lecturing at Pézenas and Montbrison, entered the priesthood at Vienne in 1692. Seven years later, at the king's own request, he preached the Advent sermons at Versailles. The greater part of his life was passed in Paris, where he was principal of the seminary of Saint Magloire, but in 1717 he accepted the bishopric of Clermont. His sermons were remarkable for their tender compassion and for their freedom from dogmatic disputation; among the finest are those on *The Small Number of the Chosen*, on *The Death of the Sinner*, and on *The Prodigal Son*. Among his contemporaries he was famous for his funeral oration on Louis XIV. Posterity cherishes his *Petit Carréme*, a course of Lenten sermons preached before Louis XV. in 1718. See lives by A. E. Blampignon, 1879, 91, and L. Panthe, *Massillon, sa prédication sous Louis XIV. et Louis XV.*, 1908.

Massillon, city of Stark co., Ohio, U.S.A., 30 m. S. by E. of Cleveland. In this region large quantities of coal are found, and white sandstone is quarried. It is also engaged in blasting and iron manuf., and manufs. threshing machines. Pop. 26,600.

Massine, Léonide (b. 1896), Russian-born dancer and choreographer, b. in Moscow. Trained at the Imperial Ballet School, Moscow, being a pupil of Enrico Cecchetti; he was choreographer and prin. dancer with the Diaghilev Ballet from 1914 to 1920. He began his career as a soloist in 1914, and as a choreographer in 1915, dominating the stage in both capacities, and establishing himself as one of the outstanding figures in the whole hist. of ballet. He succeeded Nijinsky in the Diaghilev Ballet Russé, beginning in the ambitious title-role of Richard Strauss's *Joseph's Legend*, and from the outset he showed exceptional ability and industry. Diaghilev entrusted his protégé's early artistic education to Larionov, a leading Russian modernist painter. With his first full-length ballet *Les Dames de bonne humeur*, M. realised his full potentialities, producing ballet after ballet until, for personal reasons, he left Diaghilev in 1921. Among these ballets were *La Boutique fantasque* (1919), and *Le Sacre du printemps* (1920), the first-named a one-act ballet with music by Ravel, the latter representing a pagan dancing rite to the music of Stravinsky. He showed infinite variety, besides greatly enriching the

pattern of the dance, especially by bringing it to the dances of Spain, the inspiration of Hogarth, and the cubism of Picasso. Also very notable in the hist. of the new ballet were his symphonies, including Berlioz's *Symphonie fantastique* and also Tchaikovsky's ballet *Les Présages*, experiments in which M. succeeded in creating a parallelism of movement and sound, besides extending the repertoire of choreography, though these aroused controversy among those who think that the symphony is unsuited to ballet, and that the success of M. proves nothing. Another considerable success of M. was his *Le Beau Danube*, a one-act ballet to the music of Johann Strauss, first produced in 1923. He founded a ballet school in London, 1925. He was with the Ballet Russe de Monte Carlo as producer and dancer, from 1932 to 1942. See A. Haskell, *Ballet*, 1938.

Massinger, Philip (1583–1640), Eng. dramatist, b. at Salisbury, and said to have been connected in some way with the 'noble family of the Herberts.' In 1602 he went to St. Alban Hall, Oxford, but applied himself to poetry and romance to the exclusion of the subjects associated with an academic course, and came down without a degree. He came to London about 1606 or there is little certain knowledge of his career beyond the fact that he fell into debt and appealed to Henslowe for assistance. He speaks of his 'trod-down poverty' and his life would appear to have been a constant struggle. But he soon acquired fame as a playwright. In his earlier days, from 1613, he wrote in collaboration with John Fletcher until the death of the latter twelve years later, and one of their most successful efforts was *The Two Noble Kinsmen* (printed in 1634) as being by Fletcher and Shakespeare. The date of this play is, however, uncertain, and there is argument about the Fletcher-M. authorship. The plays written by M. alone, with the dates of first performance, are *The Duke of Milan* and *The Unnatural Combat* (before 1623); *The Bondman* (1623); *The Renegado* (1624); *The Parliament of Love* (1624); *A New Way to Pay Old Debts* (probably his masterpiece, the character of Sir Giles Overreach being familiar in the hist. of dramatic literature); and *The Roman Actor* (before 1626); *The Maid of Honour* (1626); *The Grand Duke of Florence* (1627); *The Picture* (1629); *The Emperor of the East* (suggested by the hist. of Theodore the younger) (1631); *Before as you List* (1631); *The City Madam* (1632); *The Guardian* (1633); *A Very Woman* (1634); *The Bashful Lover* (some say in collaboration with Dekker) (1636). With Nathaniel Field M. wrote *The Fatal Dowry* (1632); with Middleton and W. Rowley, *The Old Law* (1656). With Fletcher he collaborated in writing *Sir John van Olden Barnavell* (acted in 1619) and in half a dozen other plays. *The Virgin Martyr* (licensed in 1620) is also ascribed to him. Of his extant tragedies *The Fatal Dowry* and *The Duke of Milan* are perhaps the best. The latter in its plot is superficially

reminiscent of *Othello* and is an impressive play. *The Virgin Martyr*, which suggests a miracle play, is also one of M.'s best plays, with its beautiful character St. Dorothy. His best comedy, as implied above, is *A New Way to Pay Old Debts*. Other good comedies are *The Guardian* (notable for the character of Durazzo) and *The City Madam*. Above all he excelled in romantic comedy. He shared much of the versatility of Middleton and also somewhat of Ben Jonson's power of exhibiting human nature as diseased, but he is a more severe satirist than Jonson. The best collection of his works is that ed. by F. Cunningham (1867). M.'s knowledge of the technique of the drama was great



PHILIP MASSINGER

but, while the construction of his plays leaves little to be desired, his characters are often lifeless. See lives by A. C. Swinburne, 1889; W. von Wurzbach, 1900; A. H. Cruikshank, 1920; and M. Eccles, 1931. See also G. Thorn-Drury, *A Little Ask*, 1921, and J. G. McManaway, *Philip Massinger and the Restoration Drama*, 1934.

Massingham, Harold John (b. 1888), Brit. literary critic and journalist, son of Henry Wm. M., editor of the *Nation*, 1907–1923. Educated at Westminster School and Queen's College, Oxford, he joined the staff of the *Morning Leader* and, from 1912 to 1914, that of the *Athenaeum*, becoming a regular weekly contributor to the *Nation* and *Athenaeum* from 1916 to 1924. He is especially noted for his studies of bird and animal life, folklore, and studies of the Eng. countryside. His works include *Some Birds of the Countryside* (1921); *Untroubled Ways* (1923); *In Praise of England* (1924); *Downland Man* (1926); *Pre-Roman Britain*

(1927); *The Heritage of Man* (1929); *The Friend of Shelley* (1930); *Country* (1934); *Genius of England* (1937); also *Remembrance*, an autobiography (1942).

Massinissa, see MASINISSA.

Mass Observation, systematic study of social habits and conditions by means of applying the techniques of anthropological research to modern highly civilised societies. The term has gained currency by being given to a new type of social research organisation founded by Tom Harrisson and Charles Madge in 1938 with headquarters in London and Bolton. Harrisson (b. 1911), the author of *Savage Civilisation* (1937), had spent a number of years in studying the primitive peoples of Central Borneo and the New Hebrides, and on his return to England he determined to apply similar methods of field-work to the study of the people of his own country. The scientific observation and recording of the habits and conditions of life of a modern community as a basis for sociological planning had been developed on the Continent and in the U.S.A., and Harrisson's conception of M. O. gave an impetus to a similar movement in the United Kingdom. See T. Harrisson, *Mass Observation*, 1937, and *Britain by Mass Observation*, 1939.

Masson, André, Fr. painter, b. in 1896 at Balagny, in the Oise dept. His early work was in a diluted post-cubist manner, resembling that of Gris, but an essential romanticism came to the fore, and he joined the surrealist movement soon after its inception in 1924. With Yves Tanguy and Salvador Dali, M. introduced surrealism to America. He has, like many of his generation, been faced with the conflict of poetic chaos and formal order, but has striven, with varying success, to find some link between the two. His work has included *décor* for the ballet, and book decorations. See M. Leiris and G. Limbour, *André Masson and his Universe*, 1948.

Masson, Antoine (1636–1700), Fr. engraver and painter, b. near Orleans. He became engraver-in-ordinary to the king. His engravings excel in the representation of colour and texture, but are marked by a peculiar style of executing hair. His original portraits are of considerable merit. One of his best prints is Titian's 'Disciples at Emmaus.'

Maason, David (1822–1907), Scottish biographer and historian, b. at Aberdeen and educated at Marischal College, and at Edinburgh, where he studied theology under Chalmers. He began his literary career in 1844 with an article in *Fraser's Magazine*. In 1853 he was appointed prof. of Eng. literature at Univ. College, London, and in 1865 he went to Edinburgh Univ. to occupy the same chair. From 1859 for eighteen years he ed. *Macmillan's Magazine*. During many years he was engaged upon a monumental *Life of Milton*, narrated in connection with the political, eccles., and literary hist. of his time, the six vols. of which appeared between 1859 and 1880. In 1874 he ed. the poetical works of Milton, and he ed. also the works of Goldsmith (1869) and

De Quincey (1889–90). In 1893 he was appointed historiographer-royal for Scotland. Other works: *Essays, Biographical and Critical* (1856); *British Novelists* (1859, 1874); *Recent British Philosophy* (1865); *Drummond of Hawthornden* (1873); *De Quincey* (Eng. Men of Letters series) (1878); *Carlyle Personally and in his Writings* (1885). See his autobiographical *Memories of London in the Forties* (1908).

Massorah, term applied to a marginal directory on the Heb. O.T. It was the work of trained scholars, named Massoretes, and consists of two parts. The Massoretic text, which is represented by all our Heb. MSS., has for its object the preservation of the traditional consonantal text and the fixing of its pronunciation by the most scrupulously careful system of vowel-points and accents. The compilation of notes, to which the name M. is usually applied, deals with difficulties and peculiarities of the text and with variant readings. From the sixth to the ninth century the M. is anonymous, but in the tenth century it is connected with the names of Ben Asher of Tiberias and Ben Naphtali. See J. ben Hayyim, *Bomberg Bible*, 1524; E. Levita, *Massoreth ha-Massoreth* (both trans. and ed. by C. D. Ginsburg), 1867; and C. D. Ginsburg's ed. of the M. (4 vols.), 1880–1906; the Massoretic ed. of the Heb. Bible (1891), and the introduction to this (1897); also P. Kahle, *Der masoretische Text des alten Testaments nach der Überlieferung der babylonischen Juden*, 1902; *Massorethen des Ostens*, 1913; and *Massorethen des Westens*, 1927–30.

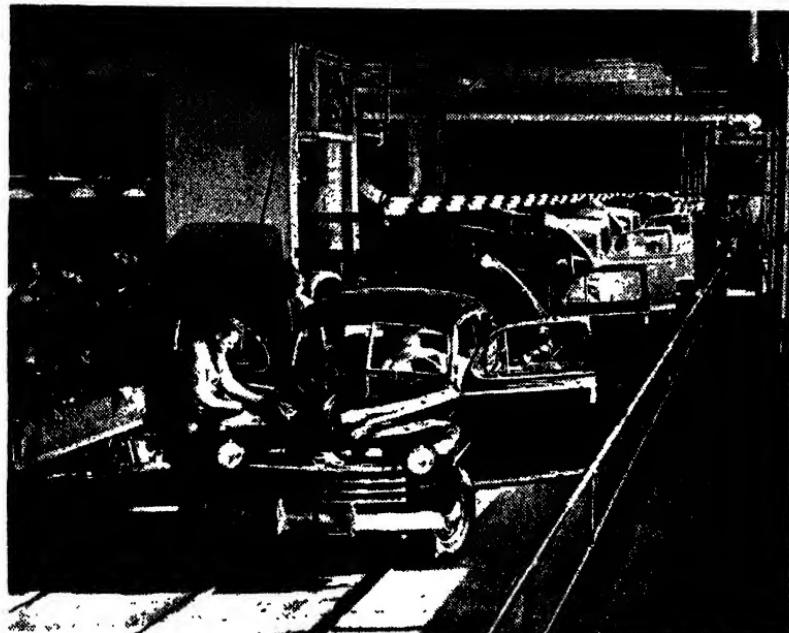
Massowah, Massaua, or Massawa, fortified seaport, cap. of the former It. colony of Eritrea, on a small sterile coral is. in the Red Sea, 1 m. in circumference and 200 yds. from the mainland. It is connected with the shore by an embankment containing the water conduit. There is a good harbour between the is. and the mainland, and an active trade is carried on with Arabia, Suez, India, etc. It is the chief port for Abyssinia and the Sudan, exports pearls, salt, ivory, ostrich feathers, jewels, coffee, tobacco, hides, etc., and has a wireless station. It is very hot and unhealthy. M. was occupied by Brit. forces on April 12, 1941. Pop. (1939) 17,000 (6000 Its., 11,000 natives). See ITALIAN EAST AFRICA, CAMPAIGN IN.

Mass Production in the U.S.A. Mass production and its concomitant, rationalisation, are, so to speak, modern Amer. inventions. In which scientific management and scientific machinery were placed at the service of industry. The goal aimed at was not only vast quantity in production of a given article or articles, but, at the same time, to safeguard the general average of quality as well; not only to increase for the owners and shareholders the profits to be gained from a given plant, but so to increase the scale of wages paid to the workers as to give them an active interest in the success of the undertaking. A further aim was so to decrease the selling price of the goods manufactured as to create a wide market for it, and so secure

continuous production of a fixed programme throughout the working year. The case of Henry Ford, the automobile manufacturer, is always cited as the classic example of M. P. He entered a highly competitive field, and by M. P. was not only able to pay his ordinary workers the highest wages in the world, but also to sell his product at the lowest price and still make huge profits. The old discarded business method was to pay the workmen

the famous shoe manufacturer of Zlin in Czechoslovakia. During the Second World War Henry J. Kaiser (*q.v.*) produced both ships and aircraft by M. P. methods, with a great increase in output.

Mass Psychology, study of the collective mind and emotional unity characteristic of a crowd of people responding to the same stimuli. Physical contiguity is an essential element, thus differentiating the crowd from the 'public,' but M. P. may



'New York Times' Photos

MASS PRODUCTION: THE FORD MOTOR COMPANY'S ROUGE PLANT AT DEARBORN, MICHIGAN

as little as possible and sell the manufactured goods at as high a price as possible. The new method pursued is in its essence this: to take the manuf. of any article and split it up into a multiple of very simple operations, which can easily be taught to the workmen. Each man has to do one comparatively easy thing all day long. The final operation comes in the assembling-room, where the various parts are put together. This presupposes that tools and machinery play an increasingly large part in the scheme of things. It is upon them that the manufacturer depends for accuracy and quality. The one great disadvantage in this kind of production is the deadly monotony of the work done by the men and women. In Europe the man who probably most nearly approached the Amer. ideal of M.P. was Thomas Bata,

be extended to cover the behaviour of any society as a whole which takes on the characteristics of a crowd, especially when acting under any widely shared emotion, whether in times of stress or general rejoicing. The psychology of the individual taking part in crowd activities is modified as the result of the predominance of the subconscious mind and a weakening of individual intellectual effort. The psychology of a crowd is therefore different from the average psychology of its individual members. Cruder impulses come into play and inhibitions to which the individual is normally subject are liable to be loosened or removed. Thus the crowd is more fickle, credulous, or courageous than would be any average member of it acting separately, and is liable to outbursts of hysteria, brutality,

or bravery. The individual becomes in effect assimilated with a new combination of impulses and reactions, and is thus part of a collective personality capable of a unified response to a common stimulus. The conscious application of stimulus in order to produce a desired reaction among large numbers of people whose individual psychology is merged in that of the crowd is known as mass suggestion. M. P. has been studied in particular by two Fr. psychologists, Gustave le Bon (1841-1931) in *La Psychologie des foules* (1895; Eng. trans. *The Crowd*, 1896) and G. Tarde (1843-1904) in *L'Opinion et la foule* (1901); also by the It. sociologist Scipio Sighele (1868-1913), whose *La folla delinquente* appeared in 1891. See also S. Freud, *Massenpsychologie und Ich-Analyse*, 1921 (Eng. trans. 1922).

Mass Radiography, method of examining a number of people in quick succession to detect latent chest disease, particularly tuberculosis. An X-ray apparatus, producing an image of the chest on a fluorescent screen, is integrated with a camera that simultaneously photographs this image on a miniature film which, in enlarged projection, enables a trained observer to tell whether or not the chest is normal and so to sift out any person with an abnormality calling for further investigation by established diagnostic methods. M. R. for the civil pop. began in Great Britain in 1943, and mobile units are operated by regional hospital boards.

Mass Spectrograph. When the light emitted by atoms in a gas is passed through a spectroscope or spectrograph to a photographic plate, the system of lenses and prism causes the light to be deviated in such a way that light of a particular wave-length (*i.e.* of a particular colour) is concentrated along a single line on the plate. The spectrum registered by the plate thus consists of a series of parallel lines, each corresponding to light of a different wave-length. The M. S. is not an optical instrument, but it derives its name from the fact that its mode of operation bears certain similarities to that of the spectroscope; moreover, the result of its action may be to produce on a photographic plate a pattern that is very similar to the one given by its optical analogue. Just as a spectroscope separates out light of a particular wave-length, so the M. S. can be used to separate from a mixture of charged atoms or groups of atoms those whose charge bears a fixed ratio to their mass. If an electric discharge is passed through a mixture of gases at low pressure, many of the atoms of the gas acquire a charge and become accelerated to high speeds. A stream of such high-speed atoms and groups of atoms can be allowed to escape through suitably placed slits into another vessel in which the pressure is so low that collisions between the gaseous atoms are relatively rare, and where they form a well-defined beam. Here the flying atomic projectiles can be deviated by the use of electric and magnetic fields, the amount of the deflections being determined not only by the strength and extent

of the fields, but also by the charges, masses, and velocities of the particles. By a suitable choice of the strength and disposition of the fields it can be arranged that particles of the same ratio of mass to charge are all concentrated to collide along a particular line on a photographic plate, while particles having other ratios are concentrated along other lines. A spectrum is thus formed whose lines correspond to particles having definite ratios of mass to charge. Since the charges of the particles, however, can only be integral multiples of the charge of an electron, and are normally equivalent to that of either one or two electrons, the masses of the particles are readily inferred, and can be compared with high precision after measurement of the distances apart of the lines on the plate. The M. S. was developed by F. W. Aston, following Sir J. J. Thomson, and has proved a powerful weapon for determining the presence of isotopes (*q.v.*), and for measurement of their masses. Modern high-powered M. Ss. have an important industrial application. See SPECTRUM AND SPECTROSCOPE.

Massys, Quentin, see MATSYS.

Master: 1. The chief or president of a society, guild, corporation, or association, as the M. of Trinity College, the M. of a masonic lodge (see FREEMASONRY), the M. of the Stationers' Company, and the Grand M. of Malta. 2. In the navy, an officer who ranks immediately above a lieutenant, and who navigates the ship under the direction of the captain. 3. In commercial navigation, the captain of the ship (skipper is used in the Merchant Shipping Act for the captain of a fishing vessel), or person entrusted with the care and navigation of the ship and cargo. He must be a properly qualified person, and upon him lies the responsibility of having a proper crew and equipment. He enjoys very wide powers, *e.g.* he may hypothecate, sell, tranship, or jettison the cargo when circumstances warrant any such course or courses being taken (see BOTTOMY, HYPOTHECATION, RESPONDENTIA). He has the same rights as an ordinary seaman, *e.g.* a maritime lien, to recover his wages and disbursements made within his authority. See MERCHANT SHIPPING.

Master and Servant. The relationship of M. and S. has been profoundly altered during the last century by the passing of the Factory Acts, the Employers' Liability Act, Workmen's Compensation Acts, Truck Acts, Minimum Wage Acts, and the Acts repealing the combination laws (see under these titles). Formerly the relationship, though nominally contractual, was purely one-sided, the servant performing accepting as the inevitable incidents of his service all the chances of sickness, accident, sweating labour, and low pay. At the present day, though there is still room for considerable amelioration, the position of a servant, so far as precautions for his safety and hygienic surroundings, and (in some cases) the rate of his wages are concerned, marks a great advance in social reform.

The terms of a contract of service may

be either oral or in writing, unless the term of service exceeds one year, when the contract to be enforceable must be in writing (*see CONTRACT; FRAUDS, STATUTE OF*). In the absence of express or implied terms or custom to the contrary, most classes of servants are understood to be employed for a year, and neither party can terminate the contract before the year has expired. For the most part, however, the length of notice is ruled by trade custom, which may vary in different cases. It is to the advantage of the servant to get the length of notice expressed in the contract if he can, rather than leave the matter to the uncertain decision of a jury. It is to be understood that no notice is required in the case of dismissal for disobedience to proper orders, dishonest conduct, drunkenness, incompetency, permanent disablement, and generally, conduct incompatible with his duties towards the master. The question of what conduct is incompatible with duty depends on the facts of each particular case.

The wrongful termination of the engagement by a master renders him liable to an action of damages for wrongful dismissal; but in the great majority of cases the action is next to useless, for the measure of damages is no more than the loss of pay during the period for which notice ought to have been given. There is no obligation on a master to give reasons for dismissal unless called upon to justify his action in a court of law. In the case of domestic servants it is to be noted that if the master chooses to pay a month's wages instead of giving notice the servant has no claim for board or maintenance. (As to contracts of service with infant employees, *see CONTRACTS; INFANT*.) Under the Truck Acts a master is forbidden to pay manual workers' wages in goods or kind. (If, however, a transaction involving a truck element could be lawfully effected by the use of an alternative form, legal proceedings under the Truck Acts to recover wages may be restrained under an Act of 1939.) The Factories Act, 1937, prohibits (generally speaking) deductions from wages. Fines may not be inflicted on a servant as a rule, except by express agreement, though it is obvious most servants have no voice in the matter.

The contract of service implies a number of duties on either side. The master is bound to indemnify the servant against all responsibility for acts done in the course of employment and ostensibly for the benefit of the master; while, conversely, the master is liable for everything his servant does in such circumstances (for *qui facit per alium facit per se*). A servant may not make a secret profit at his master's expense (*see COMMISSION, SECRET*). As to a master's statutory liability generally for injuries sustained by his servant in the course of employment, *see under EMPLOYERS' LIABILITY and WORKMEN'S COMPENSATION*.

There is no obligation on a master to give a servant a character; but if he does so he must give it in good faith. A good character given to a servant who is bad to the knowledge of the master may well

render the master liable to an action for damages at the suit of a second master. Where a master suspects his servant of theft, his best course is to dismiss him without reasons if he cannot prove the theft; but if he suspects the servant of having stolen property in his possession he should get out a search warrant from the police, for he may not himself search his servants' boxes or other private receptacles. In the bankruptcy of a master, all wages or salaries of servants or clerks for services rendered during the four months prior to the date of the receiving order, up to £50, and all wages of labourers or workmen not exceeding £25 for services rendered during two months prior to that date, have priority in the distribution of assets.

Master Mariners, Honourable Company of, is a livery company of the city of London founded in 1926. Membership is open to mariners who have held an ordinary master's certificate for five years, and now number over 600; 200 of these are freemen and liverymen of the city. There is a cadet scheme which enables young merchant navy men to begin a connection with the company early in their careers: entrants must be of first-class character, and be approved by the company's cadet committee. The *Wellington*, a sloop of 990 tons, has been moored off the Victoria Embankment to be the headquarters of the company, and to contain a nautical museum.

Master of Arts. The univ. degree next above the bachelor (*see DEGREES IN ARTS*). The word *magister* originally had the significance of teacher, and the term was used in medieval univs. of the holder of the *licentia docendi*, or right to teach. It is now mainly used in England in the faculty of arts, the corresponding degree in other faculties being that of doctor. The title of *magister artium* is abbreviated to M.A.

Master of the Ceremonies, see CEREMONIES, MASTER OF THE

Master of Sacred Theology, post-graduate degree in divinity conferred by certain foreign univs., e.g. Gregorian and Angelico Unv. in Rome. It ranks above D.D. (Doctor of Divinity).

Master of the King's Musick, official who, since the time of Charles II., has presided over the private band of the Eng. monarch. This band used to play to the monarch at meals and at state ceremonies, and to combine with the gentlemen and children of the Chapel Royal (q.v.) for the performance of king's birthday odes and New Year's Day odes, while its string section took part in the services of the Chapel Royal. It accompanied the monarch wherever he went. By 1837 the band had been reduced to a small body of wind instrumentalists, but Prince Albert reorganised it three years later. Edward VII. abandoned the giving of state concerts and the band, at present, though consisting of some thirty eminent orchestral players, is rarely called upon to perform. Elgar was master at the time of his death (1934), being succeeded by Walford Davies (q.v.), who in turn was

succeeded in 1942 by Sir Arnold Bax (q.v.) (P. Scholes, *Oxford Companion to Music*).

Master of the Rolls, see ROLLS, MASTER OF THE.

Master-singers, see MEISTERSINGERS.

Masterton, bor. tn. of Wairarapa dist., North co., North Is., New Zealand. 67 m. N.E. of Wellington. It is the centre of one of the richest farming areas in New Zealand. Has good trout fishing and wild game shooting. Pop. 10,500.

Mastic, resin produced by a small tree (*Pistacia lentiscus*). It occurs in small

The M. is believed to be the oldest breed of dog in England. There is a theory that the Phoenicians may have introduced Assyrian Ms. into England. It is estab. that the M. was known in A.-S. times; every two villeins were required to keep one M. for the destruction of wild animals. By the forest laws of Henry III. only privileged persons were allowed to keep any other dogs but Ms., which were much used for bull and bear baiting. In later times Cheshire and Derbyshire had two well-known strains of the animal. The



MASTODON AMERICANUS

A representation by G. M. Gleason. From the painting in the National Museum, Washington.

grains or tears which are soluble in rectified spirit and oil of turpentine, and are used in the manuf. of varnishes.

Mastiff, typically Brit. dog bred to its present type for sporting purposes, but now kept only as a guard or pet. It is usually docile and good-tempered, and it is very powerful and fiercely courageous. The head is large and broad, the muzzle deep, square, and broad, the ears small, and the eyes wide apart. The forelegs are straight and strong, and the hind-quarters broad and wide. Brindle was the original colour, but fawns are common. The ears and muzzle are black, and there is black round and between the eyes. The coat is short and close. At a recent census of the old Eng. M. in this country only seven dogs were found and it was suggested (1949) by the Old Eng. M. Club that without careful planning for five years, during which quarantine regulations and currency restrictions might be expected to act as delaying factors, the breed might become extinct.

M. is widely mentioned from Shakespeare to Coleridge.

Mastodon, fossil primitive elephant, belonging to the Pliocene and Miocene periods, and of a simpler type than the mammoth. The name (Gk. μαστός, breast, and οδούς, tooth) was given by Cuvier on account of the nipple-shaped tuberculations on the teeth. Ms. have been found in many parts of the world. The earlier types known as long-chinned Ms. (or *Tetralobodon*) have two pairs of tusks, the lower jaw being prolonged to support the upper pair.

Masudi, Abul Hassan Ali (d. 957), Araboian historian, b. at Bagdad. Much of his life was spent in travel, and he visited Persia, Ceylon, Madagascar, China, Palestine, Syria, and Egypt, collecting materials in every place. His chief work was *Annals* (30 vols.), but he is best known by his historical narrative entitled *Meadows of Gold and Mines of Gems*. A Fr. trans. by de Meynard was completed in 1877.

Masulipatam, seaport in the Kistna dist., Madras, India, 215 m. N.E. of Madras. The tn. used to be famous for its chintzes, carpets, etc., but since vessels have to anchor outside the port, its trade has lessened considerably. Pop. about 50,000.

Masuria, see E. PRUSSIA.

Masurian Lakes, Battle of, see TANNENBERG, BATTLE OF.

Masurium, symbol Ma. atomic number 43, atomic weight unknown. Nodack and Tacke, after an examination of certain platinum ores and of the mineral columbite, in 1923 claimed to have obtained definite evidence of a new element which fitted in with the requirements of Mendeleev's predicted eka-manganese. They relied largely on observations of X-ray spectra, and named the new element Ma. Since that time other minerals, such as sperrylite, gadolinite, and fergusonite, have been said to contain traces of Ma. Little has been heard of the new element of late years, however, and there is considerable doubt as to whether the claims made can be substantiated.

Matabele, branch of the Zulu Kaffirs, S. Africa. They originally lived in Natal, but in 1827 left it for the Transvaal under the leadership of a chief named Umsikukatze. Here they had ten years of conquest, subduing the Mashona, Makalaka, and other tribes, and in 1837, when driven out by the Boers, they had an enormous army recruited from all the conquered tribes. They then settled in the rich plains between the Zambezi and Limpopo Rs., and estab. a military despotism over the lesser nations. Their only occupations were war and hunting, and their frequent raids upon Mashona land led to an outbreak of war with Great Britain from Oct. to Nov. 1893, resulting in the defeat of the M. and the capture of Bulawayo. They are now engaged in cattle breeding and agriculture. The 'religion' of the M., like that of other Bantus, consists in a belief in the active existence of the spirits of their departed ancestors and finds expression in observances founded on that belief. The practice of witchcraft is connected with this to the extent that it embraces the use of occult means of propitiating the spirits. The superstition of 'Mlimo,' a being supposed to have played an important part in the rebellion of 1896, was borrowed by the M. from the Kalanga. The Mlimo is a deity to whom the M. used to resort as the Gks. to the Delphic oracle. Sorcery or witchcraft still figures in the social economy of the M. and the proper use of *is-Anusi* (magic) enables them to hasten the advent of rain and to foretell events, adverse events being attributed to some illicit invocation by the uninitiated. Formerly witch doctors were the instruments used by chiefs for the removal of those obnoxious to them, and missionaries have recorded stories of the most revolting cruelties practised through witchcraft. The paramount chief was once the Judge in all disputes, serious or trivial, and, in the day of Lobengula, a great part of

his time was spent in hearing and deciding cases, his retentive memory being a great aid to him in dispensing justice. Last century every male adult M. was a soldier, and the nation was divided into military dists. An estimate made in 1889 put the fighting power of Lobengula's army at 11,550 of pure M. or non-indigenous blood, and a further 10,000 composed of Makulanga from the W. and Mashona and others from N. of Bulawayo. Fighting or raiding was then the recognised and regular profession of the M. The younger soldiers were braggarts, impatient of authority, and overbearing to the last degree. Their one idea was to kill and so attain the reward of marriage, and they were constantly urging the chief to allow them to 'wipe out' the European residents. Pop. (European) in 1941 was 31,519 (males 17,244; females 14,275). See H. M. Hole, *The Making of Rhodesia*, 1926.

Matabeleland, or **Matabilland**, country in the interior of Rhodesia, which, together with Mashonaland, now constitutes S. Rhodesia. Much of the surface consists of rich plains traversed from S.W. to N.E. by the Mutoppo and Izimunte Mts., and watered by trib. of the Zambezi, Lundi, and Limpopo Rs. There is much mineral wealth, especially gold. Cereals, cotton, and sugar are grown, and there are large tracts of forest, while cattle and sheep are bred in the dists. free from the tsetse fly. The chief tn. is Bulawayo, pop. 52,700 (including 17,500 Europeans). Area 70,800 sq. m. See further under RHODESIA, SOUTHERN.

Matadi, chief riv. port of Belgian Congo, on the l.b. of the Congo below its lowest falls, opposite Livi. It is the cap. of a dist. and the starting place of the Congo railway. Pop. 22,400.

Matador, see BULL-FIGHT.

Matagalpa, dept. in the centre of Nicaragua. Its chief productions are coffee and tobacco. The cap. is M. Pop. 51,100.

Matamoros, tn. in the state of Tamaulipas, Mexico, on the S. bank of the Rio Grande, opposite Brownville, Texas. A 200-m. highway joining M. and Oaxaca, Mexico, was opened in 1945. It exports hides, wool, horses, and specie. Pop. 2000.

Matanzas: 1. Prov. of Cuba, bounded by Havana, Santa Clara, and Florida Strait. Largely mountainous, especially in the N.; it is watered by the Yumuri, San Juan, Palma, and Sagua Rs. In the S. is the great swamp, Gran Ciénaga Occidental de Zapata. Sugar, cereals, fruit, cotton, and tobacco are grown. Area 3260 sq. m. Pop. 361,100. 2. Fortified port and cap. of above prov. on M. Bay, and the San Juan and Yumuri Rs. It has large sugar factories, and exports sugar and other produce. Pop. 74,000.

Matapan, Battle of Cape (March 28, 1814), most sweeping Brit. naval victory since the battle of Trafalgar, fought between the Brit. Mediterranean fleet under Adm. Cunningham and the It. main fleet under Adm. Riccardi. The victory was without precedent in that it was won without any Brit. casualties, or even the slightest material damage to the Brit.

ships, though one naval aircraft was lost. The forces opposed were Brit.: 3 battleships, 1 aircraft carrier, 4 cruisers, and a number of destroyers; It.: 3 battleships, 11 cruisers, and 14 destroyers. The Its. lost the heavy cruisers *Zara*, *Pola*, and *Fiume*, all sunk; a 6-in. gun cruiser of the Colleone class sunk; the large destroyers *Vincenzo Gioberti* and *Maestrale* were both sunk, and another destroyer was seriously damaged. A new battleship of the Littorio class also sustained serious damage, and other units were also damaged, but inasmuch as the chief action took place at night the precise loss was not known. The battle was the first in hist. in which skilful co-ordination of naval operations with attacks launched by naval aircraft resulted in enemy ships' speeds being so reduced as to force them to action. Some 55 It. officers and 850 men from It. sunken vessels were picked up by Brit. and Gk. destroyers. Adm. Castroni, commanding the It. heavy cruiser squadron, was lost in the *Zara*. Some hundreds more It. survivors would have been rescued by allied forces had not their life-saving operations been interrupted by dive-bombing attacks by the Ger. Air Force, one Junkers 88 being shot down.

At noon on the previous day R.A.F. Sunderland planes spotted the It. fleet putting to sea. Adm. Cunningham and the main fleet were then at Alexandria. Concluding that the It. ships intended to attack convoys carrying supplies from Egypt to Greece, the Brit. admiral ordered Vice-Adm. Pridham-Whippell, commanding the light-cruiser force, to sail to a position S. of Crete, from which he could intercept ships interfering with convoys. The commander-in-chief, with the flagship *Waspire* and the other battleships *Barham* and *Valiant*, the aircraft-carrier *Formidable*, and some destroyers, steamed N.W. in the afternoon in the hope of intercepting the enemy. Briefly what happened then was that the vice-admiral in the light cruiser *Orion*, acting as a decoy, for hours lured the unsuspecting enemy ships towards the main Brit. fleet, until they were caught about 100 m. S.W. of Cape Matapan. This was no easy task, and the vice-admiral at times lost touch with the enemy, as indeed might have been expected from the fact that he had to manoeuvre so as to save his ship from being hit by the fire of It. battleships or heavy cruisers. Shortly before 8 a.m. of the following day Brit. reconnaissance aircraft reported an enemy force comprising one Littorio-class battleship, six cruisers, and seven destroyers some 35 m. S. of Gavdo Is. (about 25 m. S. of Crete). This force was soon afterwards joined by two more cruisers and two more destroyers. The Brit. vice-admiral's forces were then some 40 m. S.E. of the enemy, and Adm. Cunningham was some 95 m. away, and steaming N. westward, a direction he held throughout until the dramatic denouement at night when the Brit. ships opened fire on the It. cruisers S.W. of Cape Matapan. It seems that at about 9 a.m. the It. cruisers turned

N.W. too, steaming on a parallel course with the Brit. main fleet, some two battleships and three cruisers being N. of the Brit. fleet and another battleship and eight cruisers, further S., crossing and recrossing the bows of the Brit. ships without suspecting their presence. Prior to the final act of the drama Brit. naval aircraft from the *Formidable* launched seven highly effective attacks, thrice hit the Littorio-class battleship, and made two direct hits on a cruiser and one on a destroyer. The hits on the battleship drastically reduced its speed, and at dusk two more attacks were made, one cruiser being hit by a torpedo. The combined Brit. light and heavy forces were now in full pursuit of the enemy who, alarmed by the naval aircraft, was now speeding for his bases. Shortly after 10 p.m. Adm. Cunningham turned the battle fleet to engage the cruiser *Pola* which had stopped evidently damaged, some 3 m. distant. At the same time three more It. cruisers crossed the bows of the Brit. ships at the culminating point 100 m. S.W. of Cape Matapan. As the It. cruisers passed ahead of the Brit. main fleet's destroyer screen the destroyer *Greyhound* illuminated the leading It. heavy cruiser. The Brit. battle fleet at once opened fire. The enemy was taken completely by surprise. The first salvos hit the It. ships at the amazingly short range of 4000 yds., and wrecked two heavy cruisers. It is therefore not surprising that these cruisers disintegrated. Enemy destroyers now turned to fire torpedoes, and the Brit. main fleet turned away to avoid them, leaving destroyers to complete the sinking of the *Zara* and *Pola*. It is probable that the battleship of the Littorio class, which had turned off between the Brit. fleet and It. cruisers, became heavily engaged in the darkness and confusion with her own forces, and so multiplied casualties. At this juncture a force of Gk. destroyers steamed out to the W., but the rest of the It. forces had made good their escape. See A. Hurd, *The Battle of the Seas*, 1941; C. King, *Rule, Britannia*, 1941; and H. G. Thursfield, *Action Stations*, 1942.

Mataram, cap. of the is. of Lombok, Dutch E. Indies, situated near the W. coast.

Matariyah, vil. of lower Egypt, 5 m. N.E. of Cairo. It is built on the site of the anc. tn. of On or Heliopolis.

Mataro, city in the prov. of Barcelona, Spain, on the Mediterranean. Its chief manufis. are cotton and woollen goods, chemicals, glass, and soap. Pop. 24,700.

Matches. Tinder, or dried cotton fibre, had been partly replaced by paper soaked in saltpetre, and largely by wood tipped with sulphur, in the early nineteenth century. In 1805 M. Chancel coated the sulphur with a paste of chlorate of potash, sugar, and gum, which ignited on touching concentrated sulphuric acid conveniently carried soaked in asbestos fibre. Phosphorus, which inflames at ordinary temps. when dry and exposed to the air, was next experimented with, but with little success at first. The 'Lucifer' was tipped with the chlorate of potash paste with anti-

mony sulphide, and ignited by friction on sandpaper. In 1827 'Congreves' came into use, the tips being of sulphur, phosphorus, and chlorate of potash, or of phosphorus and nitre, slight friction only being required. By about 1830 commercial manuf. was started, the industry centring in Austria and Germany. In 1846 amorphous phosphorus (*q.r.*) was discovered by von Schrotter of Vienna, and used in 1855 by Lundstrom of Sweden in 'safety' M., patented in England by Bryant & May. The phosphorus was transferred from the match tip to the frictional surface on the box, friction elsewhere not igniting the match. Amorphous phosphorus is innocuous in processes of manuf., but white phosphorus, being cheaper, is still used, though in most countries its abolition has been attempted, e.g. in Great Britain by the White Matches Prohibition Act of 1908. Factory inspection has improved conditions and practically removed chance of disease. It still remains, however, to find a completely safe but equally economical substitute.

Ignition Paste.—The substances used are known chemically as oxidising agents, substances which readily part with oxygen, and reducing agents or substances which readily combine with oxygen; one for the match tip, the other for the frictional surface. Among oxidisers are chlorate of potash, dichromate of potash, manganese peroxide, nitre, and red oxide of lead; reducers: white and amorphous (red) phosphorus, sulphide of antimony, and certain sulphocyanides and thiosulphates. As a sample mixture chlorate of potash, dichromate of potash, antimony sulphide and red lead for the match tip; amorphous phosphorus and antimony sulphide for the frictional surface. In addition, glue or dextrine, sand, powdered glass, whitening, and various colouring matters are used. 'Strike anywhere' M. usually contain for the tip a mixture of phosphorus sulphide, P_2S_5 , an oxidising agent (*e.g.* potassium chlorate), glue, and powdered glass. They are first impregnated with paraffin or with sulphur.

Manufacture.—The industry tends to move naturally to regions where timber is readily available, as in Norway and Sweden. England and Belgium import timber and have large factories. Germany, Austria, France, and the U.S.A. also export largely. In France the manuf. is a farmed gov. monopoly; in the U.S.A. taxes and duties have led to trust monopoly. **Splints** are of pine and aspen. In the Swedish or continental method logs of calculated size are placed on a turning lathe; a knife, acting on the full length and advancing at each rotation, cuts off a ribbon. The ribbons are packed together and cut into long bands as broad as the length of a match. The bands are then fed into a machine which rapidly jerks them forward, the distance of each movement being the breadth of a match, while a synchronised knife cuts completely through. The splints, after being dried, are sifted and arranged by machinery and the same method is universally adopted as with the round splints (see below), i.e.

punched into endless conveyor plates and dipped by pressing on to composition table or running over roller which is revolving in composition. In Britain V. L. Long's machinery is used, which deals with blocks which are cut by two slicers, vertical and horizontal. Round splints are split by circular cutters in rows. They are carried in drums to tanks, where they are immersed in an impregnating solution of salts (to prevent the wood from breaking off and from glowing after use), dried, and blown up a large pipe into vibrating screens, from which they are collected and sorted. From these they are pushed by rods into slightly smaller holes in an endless band; after dipping in paraffin they are carried over a synchronously moving roller covered with ignition paste, dried by passing a considerable distance in the air on endless belts (about 400 ft.), punched out, and automatically packed.

Matchlock, see FIREARMS and GUN.

Mate, term generally applied to any person who is an assistant or a deputy in any work. In the navy the term is now applied only to petty officers who do not hold his majesty's commission, *e.g.* boatswain's M. In the mercantile marine, however, the M. occupies the position of an officer in the navy. The first M. ranks as the chief officer, and is second only to the master of the vessel. Nearly all merchant ships carry three Ms. and large ships carry more.

Maté, or Paraguay Tea, dried leaves of the Brazilian holly (*Ilex paraguayensis*), an evergreen shrub, grown in 'verbenas' in Paraguay and Brazil. The best quality of M. (*caai-ys*) is made from the unexpanded buds; the second (*caai-miri*) from leaves from which the midrib has been removed, and the third (*caai-gazu*, or *verra dos polos*) from the whole leaf. The leaves are infused in water and sugar, and either milk or lemon is added to the liquid, which is rather bitter in taste, but has restorative qualities.

Matera, tn. in the prov. of Potenza, Italy, 34 m. W.N.W. of Taranto. It has a picturesque situation and is close to the troglodyte caves of Monte Scaglillo, still used as dwelling-places. It manufs. leather. Pop. 22,000.

Materialism, form of monism (*q.r.*), is the philosophy of the material as opposed to the idealistic. It denies the existence of non-material or spiritual being and regards all phenomena, real and abstract, as explicable by physical science. It regards matter as the one ultimate fact, 'uncreatable as it is indestructible' (Vogt), and mind as a product of matter. M. is to be found in all philosophical systems, from anc. Buddhism and Gk. Epicureanism and scepticism down to Gassendi, Hobbes, Locke, Hume, Comte, Helvétius, and Mill; and later Huxley, Spencer, and Haeckel. M. flourished in Europe during the eighteenth century under De la Mettrie and Holbach as a reaction against Christian mystic-idealism, and during the nineteenth century under Moleschott and Böchner as a reaction against the idealism of Kant and Hegel. The obvious objections are (1) that, as Caird points out, the

recognition of the existence of matter presupposes the existence of mind as the medium of such recognition; and (2) that, taking, for example, imagination as one particular aspect of consciousness, the mind can originate an idea when wholly abstracted from matter, whilst matter cannot originate an idea when abstracted wholly from mind. Recent research in physiology, while seeming to confirm the materialistic hypothesis of the relation between neurosis and psychosis, and so giving an enhanced value to sensuous perception as the fundamental source of cognition, yet offers no justification for the belief of the eighteenth-century Fr. school of sceptic encyclopaedists, that mental experience, faculty, idea, and function are merely transformed sense experience.

During the nineteenth century the mass of scientific thought supported M., and especially was this support found among the profs. of physics, astronomy, and philosophy. M. was discussed by them, particularly in relation to evolution. The indubitable fact of evolution provides speculation as to its causes and purpose; but whatever view was held as to these there was general agreement that evolution was a purely material process.

The conclusions of investigators who examine the constituency of matter down to the analysis of the atom itself disprove the solidarity of material things. Even the dogma that material effects flow from material causes is regarded with scepticism, especially since the theories of Einstein have proved the accepted findings of Newton to be in error. Biologists assert that the conduct of a material thing is merely a form of reply to an external stimulus, but that in living creatures such instincts as the preservation of life can be explained by no such creed, that in a dead body all the material parts are present and the departed power to function, the will, comes within no laws governing matter. In the region of physics modern discoveries show that the material universe can no longer be regarded as tangible, occupying any defined position, and though there are undoubtedly laws which direct it, those laws are as yet unfamiliar and involved in mystery. The solidarity of matter is found to be merely a form of energy. Space itself eludes the limitations imposed upon it by Euclid, when considered by Relativists, and emerges from their studies with a fourth dimension involving the significance of time—that is, a body's position in space according to time, since its position changes with time. Psychologists add their evidence, especially in the study of memory, and Bergson has shown that the theory that the brain has any material connection with thought is fallible, since his own observations prove that living beings can continue to experience sensations hitherto claimed to emanate from a certain part of the brain after that portion has been removed by operation. Thus the present trend of opinion leads to the conclusion that M. will eventually claim significance merely as a curiosity of philosophical hist.

Dialectical M., a phrase coined by Karl Marx who, though neither a trained philosopher nor a natural scientist, convinced himself that he understood the philosophical implications of the scientific discoveries of his day, and that these implications constituted the general philosophy, which, deriving from the Hegelian dialectic, he called 'dialectical M.' Marxists assume that, unless the student has a proper idea of this philosophy, he cannot understand the objectives of Communism; but it would seem doubtful whether this obscure philosophy has any logical connection with the social theory professed by Communists. *Historical M.*, on the other hand, if not free from obscurities, is, on the whole, intelligible. It is clearly and vigorously stated by Marx in the *Communist Manifesto* (1847), and in the preface to his *Critique of Political Economy* (1859), and the gist of the theory is that to every system of production there is an appropriate system of property; that while the system of production changes continuously, the system of property before the Socialist society has come into existence, will necessarily resist this change; and that there is, consequently, in every society prior to the Socialist one, an inherent contradiction giving rise to a conflict of classes, each of which will evolve an ideology adapted to its own interests.

See E. Buchner, *Force and Matter*, 1864; G. H. Lewes, *Problems of Life and Mind*, 1874-79; H. Cunow, *Die Marxsche Geschichts-, Gesellschafts-, und Staatstheorie* (4th ed.), 1923; Sir F. A. Lange, *History of Materialism* (trans., 1926); J. S. Haldane, *Materialism*, 1932; G. Sainsbury, *Dictatorship of Things*, 1933; and G. V. Plekhanov, *In Defence of Materialism*, 1948.

Materials, Strength of, subject which deals with the study of the distribution and effect of internal forces produced in M. of construction subjected to straining actions. It is not an exact science, like the mathematical theory of elasticity, which is concerned mainly with problems of a physical rather than an engineering interest, but is founded partly on the result of experiment, and partly on conclusions drawn therefrom by the application of the principles of mathematics and mechanics. Within practical limits it enables formulae to be estab. which allow the strength of a given part to be assessed, and in this way suitable material and dimensions may be chosen.

Stress.—The application of load causes internal stress in the material. Such stress is the force transmitted from a part of the material to the portion with which it is in contact, or it may be regarded as the force which the internal structure of the material exerts to oppose the tendency to alter its size and shape. The constituent forces, and therefore the stress, are distributed across the imaginary surface where interaction takes place, and the intensity of stress at a surface, generally referred to as *stress*, is estimated by the force transmitted per unit of area. However complex the loading, the states of stress existing within a body may be

reduced to the following: tensile stress, compressive stress, and shear stress.

Fig. 1a shows a bar of uniform cross-sectional area of A sq. in., subjected to an axial pull of P pounds. At any plane xx perpendicular to the axis of the bar, the

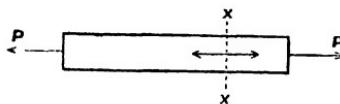


FIG. 1a

material is under a tensile stress, the intensity of which is $\frac{P}{A}$ lb. per sq. in. In Fig. 1b the direction of the force is reversed, and the material is being crushed.

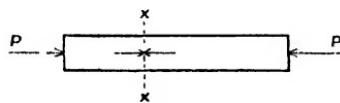


FIG. 1b

The stress at any section xx is a compressive stress, and its intensity $\rho = \frac{P}{A}$ lb. per sq. in. Shear stress exists in a body when the action of the load tends to cause one layer of material to slide over an adjacent layer. This is illustrated by Fig. 1c.

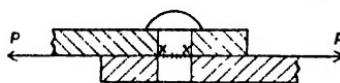


FIG. 1c

where the material of the rivet is under a shear stress across the section xx , the average intensity of which is $q = \frac{P}{A}$ lb. per sq. in., where A is the area of cross-section of the rivet.

Strain is the alteration of shape or dimensions resulting from the stress. Thus a tensile strain is the stretch in the direction of the tensile stress, and a compressive strain is a shortening. If a length of l units is stretched to $l + \delta l$, then the tensile strain per unit length, called the fractional strain, is equal to $\frac{\delta l}{l}$. The compressive strain is computed in a similar manner. The shear strain is slightly more complicated to visualise, and is generally reckoned as an angular displacement measured in radians.

If the material returns to its original shape and dimensions when the load has been removed, it is said to be elastic, and it is an important condition which must be satisfied by engineering M. under working conditions. In all bodies under increasing load there is some stress, up to which no permanent set or deformation is observed on the removal of the load; this

is called the elastic limit, the point below which the material may be regarded as quite elastic. Within the elastic limit the stress is proportional to the resulting strain; this is known as Hooke's law, and in the case of an elastic material subjected to a tensile or compressive load may be

written: Stress = E , where E is a constant known as the modulus of elasticity or Young's modulus for the particular material.

E is generally expressed in Britain in pounds or tons per square inch. In the case of a material under a shear stress within the elastic limit, a similar relation, viz.: Shear Stress = G , holds

where G is a constant for each particular material and is called the modulus of rigidity.

The most commonly applied test of metals used in construction is the tensile test, which consists of stretching a specially shaped specimen by a gradually applied, uniformly increasing load until it fractures. From this test, by plotting stress and strain, the elastic limit and ultimate strength may be found. The ultimate strength is the ratio

Maximum load

Cross-sectional area of Specimen'

Material which is subjected to frequently repeated fluctuating stresses will fracture at stress much lower than its ultimate statical strength. Stresses of this type may vary in intensity from zero to a maximum, or they may alternate from tensile to compressive. In such circumstances the material is said to have become fatigued.

See J. A. Cormack and E. R. Andrew, *Properties and Strength of Materials*, 1939; A. Morley, *Strength of Materials*, 1940; and F. V. Warlock, *Strength of Materials*, 1945.

Materia Medica, branch of medical science dealing in as complete a manner as possible with the hist., preparation, properties, uses, and action upon the body, of the drugs used in medical prescriptions.

Anet, Egyptian, Chinese, and Jap. writings included extensive M. M. In the first century A.D. Dioscorides wrote on medicinal herbs, and some of his writings were trans. and incorporated in Arabian M. M. Nearly 800 medical plants were mentioned in a M. M. of India, written about the fifth century A.D. In most countries there are official publs., e.g. *British Pharmacopœia*, by the General Medical Council. This has been rendered necessary to combat medieval superstitious remedies as well as those of modern quacks, and indirectly is supported by law. The *London Pharmacopœia* was first pub. in 1618, and prescribed foxes' lungs as a cure for asthma. Two other eds. pub. during the seventeenth century included such remedies as 'moss from the skull of a victim of violent death,' and Irish whisky. An official list of drugs contains only those which have passed the test of experience, and of which

the knowledge is sufficient to render them safe in use. Many good drugs are introduced and in regular use before proprietary medicines, generally consisting of official drugs in a patent compounded form, appear. M. M. is very extensive, and includes widely different topics. Its most important branch deals with the preparation of drugs in the pure state, and the recognition of adulterations; this comes under the head of *Pharmacy*. *Pharmacology*, another branch, deals with the physiological action of drugs on the living body, in large and small doses, in health and disease, and of the chemical form, solution, etc., in which best administered for assimilation by the body. *Toxicology* confines itself to drugs of toxic or poisonous action, and ascertains particularly the range of 'safe doses.' All these branches merge into *Therapeutics*, which is the concern of the medical practitioner. Classification of drugs is very varied and overlapping; chiefly there is the ordinary chemical classification, e.g. alkaloids, salts, infusions; and classification according to therapeutic action, e.g. tonics, sedatives, stimulants. See S. O. Potter, *Therapeutics and Materia Medica*, 1931; R. H. Micks, *The Essentials of Materia Medica, Pharmacology, and Therapeutics*, 1947; and A. H. Douthwaite, *A. H. Hale-White's Materia Medica, Pharmacy, Pharmacology, and Therapeutics* (28th ed.), 1949.

Maternity and Infant Welfare. Public interest was not directed towards the welfare of infants and of women during M. until the twentieth century. The Notification of Births Act was passed in 1907, and in 1915 this was extended to give local authorities the right to levy rates for infant welfare work. The first welfare centre was opened in 1906 by Dr. Eric Pritchard in the bor. of St. Marylebone. The next to be opened was in St. Pancras, and came to be known as the 'School for Mothers' from the fact that class instruction was given to mothers in the care of infants, sewing, cooking, etc. By 1910 ninety M. and I. W. centres were in existence, but the majority of these, especially the lying-in hospitals, depended on voluntary work and subscriptions. By 1939 there were 2300 centres in England and Wales, nearly 75 per cent of which were maintained by local authorities while the remainder were provided by voluntary associations. From 1910 to 1914 the Board of Education and the Local Gov. Board (now part of the Ministry of Health) helped to finance the M. and I. W. centres and institutions. In 1918 the Maternity and Child Welfare Act was passed, empowering co. and local authorities to give assistance, subject to the approval of the minister of health, to assist expectant and nursing mothers and children below the age of five. Provisions were also made towards a grant in aid of M. and I. W. centres, both voluntary and municipal. M. allowances were frequently discussed, but were not introduced in Great Britain until 1946, in which year was passed a National Insurance Act (q.v.), which provided *inter alia* a M. allowance of 36s. and

an attendance allowance of 20s., together with a M. grant of £4. There were schemes for such allowances in operation in other countries before this, e.g. in New Zealand (introduced in 1938), in some of the Canadian provs., and in Sweden, etc. With regard to midwifery, the standard was raised after the passing of the Midwives Act in 1902. M. homes have to be registered, and M. benefit was allowed under the National Health Insurance Act of 1911 (40s.), and this provision was repeated in the subsequent Acts, including the Act of 1941.

Local authorities have no power to establish birth-control clinics as such; but information regarding birth control may be given at M. and child welfare centres, or at special clinics for women suffering from gynaecological disorders. Such information is exclusively given to married women attending the clinics in whose cases further pregnancy would be detrimental to health. The Association of Infant Welfare and Maternity Centres, 117 Piccadilly, London, is one of the largest associations of its kind. In 1936-37 the cost of the public M. and welfare service in England and Wales was £3,590,000. The birth rate in 1928 was 16·7 per 1000 persons, and the infant mortality under one year was 65 per 1000 births. In 1946 the figures were, respectively, 19·1 and 43. Maternal mortality in England and Wales in 1938 was 19·7 (i.e. 2·97 per 1000 total births); in Scotland 432 (4·9 per 1000 births); and in N. Ireland 96 (3·80 per 1000 births). In 1945 the figures were, respectively, 12·57, 236, and 70. A survey of the social and economic aspects of pregnancy and childbirth in Britain was undertaken by a joint committee of the Royal College of Obstetricians and Gynaecologists and the Population Investigation Committee. Through the co-operation of 424 maternity and child-welfare authorities in Great Britain, it was possible for health visitors to interview some 14,000 women who had had their confinements during a week in March 1946. The findings of the committee were to some extent disquieting and disappointing in view of the large sums expended on the health services. The outstanding fact was the social class inequalities of the maternity services in Britain. Those women who belonged to the registrar-general's Social Class I. were much better off not only in material wealth, but also in the kind of attention they received when pregnant compared with the poorer women in Social Class V. Most of them had doctors in attendance at the time of confinement, so that they were sure of being given more analgesic drugs during labour. Furthermore they ceased work much earlier in pregnancy and arranged for ante-natal supervision sooner than those women who had to work, and who already had children. Finally the favoured group tended to have their confinements in hospitals or in private maternity homes. In the U.S.A. there is now some, but no unified, system of compulsory registration of births throughout the country. The rate of maternal

mortality is higher in the U.S.A. than in many of the prin. countries of the world. In 1938 the rate was 50 per 10,000 live births as compared with 30 per 10,000 births in Italy or Holland, and this was the lowest rate recorded in Amer. statistics. But M. and I. W. work has done much to reduce both that and infant mortality, and the Amer. system of M. hospitals is without equal. In other countries of the world the work has progressed, especially in Belgium and Holland, which were two pioneer countries, and M. and I. W. has been the subject of many recent conventions, the most important being the Geneva Declaration (1924). The Save the Children Fund is an international organisation which is devoted to M. and I. W. work. Practically world-wide laws exist to prevent women working immediately after confinement, and in some countries before. The women of Soviet Russia receive particular help, being allowed by the state full pay during two or three months before and after child-birth if they are employed, or a grant if their husbands only are employed. The League of Nations, through the International Labour Office, directed attention towards the need of protection of women both before and after child-birth, and a draft convention relating to this was adopted at the International Labour Conference, held at Washington in 1919. See Janet Campbell, *Maternal Mortality*, 1924; H. H. Gregory, *Infant Welfare*, 1926; E. Fuller (ed.), *The International Handbook of Child Care and Protection*, 1928; G. F. McCleary, *The Early History of the Infant Welfare Movement*, 1933, and *The Maternity and Child Welfare Movement*, 1935; and *Maternity in Great Britain* (a survey by a joint committee of the Royal College of Obstetricians and Gynaecologists and the Pop. Investigation Committee), 1949.

Mate-Szalka, tn. in the com. of Szatmar, Hungary, 44 m. N.E. of Debreczen. Pop. 7000.

Matef, Ermengau (c. 1250-1322), Provençal writer, b. at Béziers, spent the latter part of his life in the monastery of Béziers. His great work, the *Breviari d'Amor*, was begun in 1288. It has been pub. in 2 vols. by Azals (1862, 1881).

Mathematical Instruments, see CALCULATING MACHINES; COMPASSES; PLANIMETER; SLIDE RULE; MECHANICAL DIFFERENTIAL ANALYSER.

Mathematics (Gk. *μαθηματική* from *μαθαίνειν*, to learn, and *τέχνη*, art) is the science of space and number, and is the basis of all other sciences. The attempts to create a philosophical basis for M. are very abstruse. For practical purposes M. is divided into pure M., of which the prin. branches are arithmetic, algebra, geometry, trigonometry and calculus, and applied M. which includes mechanics, kinetics, thermodynamics, the theories of light and electricity, astronomy, statistics, relativity, and quantum theory. There is no hard and fast dividing line, but broadly speaking pure M. is abstract and can be developed and studied without reference to physical laws, whereas applied M. is based on experimental

discovery, is designed to elucidate it, and is often the precursor of new advances in natural science.

The reader will find separate articles devoted to most of the branches of M. named above; the purpose of the present article is to give an outline of the development of the subject. It is true that the Chinese and Hindus in the earliest times evolved crude methods of counting and measuring; that the Babylonians devised a system of numeration is clear from their cuneiform writings, while 1 Kings vii. 23 shows that the existence of a relation between the diameter and the circumference of a circle had been noted, if incorrectly, at that time. Nevertheless the hist. of M. properly begins with Thales of Miletus (640-546 B.C.), for to him we owe the first theorems in plane geometry and the logical proofs of the same. Pythagoras (sixth century B.C.) did not merely make the valuable contributions to geometry with which we are familiar to-day; he estab. it as a dignified branch of learning among the Gks., so that Hipparchus, Plato, and Aristotle prepared the grounds for the renowned school of geometers at Alexandria that produced Euclid, Archimedes, and Apollonius. This school flourished between 300 and 30 B.C. and the system of Euclid's geometry was the result of their work. The range of their research was so great that geometry made no further material advance until the seventeenth century A.D. The Gks. were not only geometers. Hipparchus was the most famous astronomer of their civilisation, and his contributions to M. include the beginnings of trigonometry. Archimedes has the greatest reputation of them all, because he also began the study of mechanics with his principle of the lever, and his researches in hydrostatics or the mechanics of fluids at rest were the first contributions to that branch of M. Arithmetic made very little progress at the hands of these Gk. mathematicians, a fact that is not surprising when we reflect that they handicapped themselves by adopting the letters of the alphabet for their system of numbers. Ptolemy (second century A.D.) extended the work of Hipparchus, and Diophantus (fourth century A.D.) began the study of universal arithmetic or algebra, but he too was at a disadvantage because of the laborious arithmetic inherited from the Gks. Roman civilisation added nothing of note to M., although Boethius became acquainted with a few of the theorems of Euclid, and he gave to Europe a Lat. trans. of his scanty knowledge of geometry.

The revival of M. in Europe began in the twelfth century, when Adelard of Bath became acquainted with a Lat. trans. of Euclid's *Elements*. This book he obtained from the Arabs, who had made an extensive study of M. from the eighth century onwards. They resurrected the geometry of Euclid, and they adopted the arithmetic of the Hindus who had found in Brahmagupta (seventh century A.D.) the source of inspiration of modern arithmetic. The Arabic system of arithmetic developed rapidly in Italy and in England, and the

study of algebra was based on a trans. of Al-Khwarizmi's treatise. With the invention of printing and the revival of learning generally during the Renaissance arithmetic gradually became simplified by the evolution of the ordinary processes of addition, multiplication, etc., that we know to-day, while algebraic symbols and operations slowly approached their present form.

The story of modern M. begins at the end of that epoch, viz. the close of the sixteenth century, and it is an uninterrupted account of brilliant achievements.

practically intact. Algebra, astronomy, optics, and other branches of physics bear the imprint of his genius; the honour of inventing the infinitesimal calculus he shares with Leibniz. The infinitesimal calculus is undoubtedly the greatest of all mathematical discoveries, the key which has unlocked the secrets of all the physical sciences. Its discovery marks the beginning of the modern period in M., which has contributed far more to mathematical knowledge than the previous 2000 years. The calculus provides a means of dealing in mathematical form with the



PART OF THE DIGITAL ELECTRONIC COMPUTING MACHINE AT MANCHESTER UNIVERSITY

The section on the left contains the control circuit, in the middle rack of which is a cathode ray tube screen with (below) the control panel. The overhead cables carry information to and from the memory section of the machine (not shown). The racks nearest the camera contain the calculating circuits.

The machine is 'fed' at the control desk and the answer is read on the cathode ray tube.

Geometry had been marking time since the days of Euclid, waiting as it were for a simple algebra. It took on a new lease of life with the invention of algebraical geometry by Descartes in 1637. His system is well known: a point is represented by a pair of numbers (x, y) that specify its position with respect to two fixed axes of co-ordinates. On this system of plane geometry a straight line is represented by an equation of the form $lx - my + n = 0$, and the conic sections by an equation of the second degree $a{x^2} + 2hxy + b{y^2} + 2gx + 2fy + c = 0$. The time was ripe for the greatest mathematical genius of all time, and during the seventeenth century Newton made ample amends for the dark ages of M. His book the *Principia* gives us an idea of the debt M. owes to him. He built up mechanics at an amazing rate, and his system is still

concept of continuous variation, and the principle of continuity extended enormously the content of algebra and geometry, and led later to the theory of complex and imaginary numbers and the whole structure of projective geometry. During the eighteenth century the work of such men as Euler, Laplace, Lagrange, and Gauss, and the establish. of Taylor's theorem of infinite series provided the tools and the means of calculation required for the far-reaching technical developments in mechanics and electricity that were to come later. The nineteenth century saw the invention by Lobachevsky and Riemann of 'non-Euclidean' geometry, later to be used for Einstein's theory of relativity, and another revolution in mathematical calculation in the discovery of quaternions and vector analysis, which simplified the operations

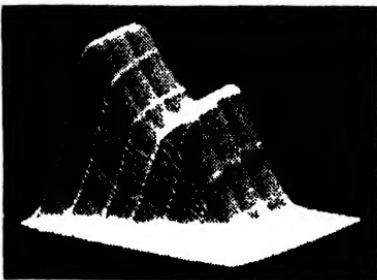
of multiplication, division, etc., where both vector and scalar quantities are involved. In astronomy the foundations laid by Copernicus, Tycho Brahe, Kepler, and Galileo were rapidly surpassed, and new methods and ways of thought led firstly to a much vaster and more exact astronomy, and later to the quasi-inertial physical theories of the nature of universal space which have been a feature of the twentieth century. At the microcosmic end of the scale, the refinements of mathematical analysis led to those brilliant discoveries in the fields of wave-theory, X-ray, radio, and atomic structure, which are promising at present to increase the powers, and with them the responsibilities, of civilised man.

It is interesting to note some of the practical aids to mathematical computations that have proved their worth. The earliest of these is the abacus (*q.v.*) that was used in various parts of the world for the processes of addition and multiplication (by repeated addition). Another early piece of apparatus for addition was a flat polished tablet covered with sand on which figures were made with a stylus. Arithmetical computations were greatly simplified by the invention of logarithms (*q.v.*) by Napier (*q.v.*) in 1614; the logarithmic tables now in use are due to Briggs, who first pub. his tables in 1617. They are logarithms of the natural numbers to the base 10. Briggs is also credited with the improvement of the decimal notation first invented by Stevinus. Hipparchus constructed the first trigonometrical tables, and these were extended by Hindu mathematicians. The modern tables are based on those of Rheticus (sixteenth century) and Briggs, the latter being the first to publish tables of the logarithms of trigonometrical functions.

Mechanical aids to the ordinary processes of computation followed rapidly. Gunter designed his logarithmic line of numbers (*see LOGARITHMS*) that was simply a straight line with the numbers 1 to 10 arranged on it, the intervals between 1 and another number were directly proportional to the logarithm of that number to the base 10. Shortly afterwards, in 1630, Wingate invented the first slide rule of the straight edge pattern, which was really two logarithmic lines of numbers placed side by side, one fixed and the other movable. The modern slide rule has descended from that of Mannheim, who in 1850 introduced the cursor, the travelling runner with its finely graduated line that enables the readings to be made across the scales with great accuracy. Hundreds of various patterns of slide rules have been patented since that time, and they are employed extensively in engineering and commerce. Recently calculating machines (*q.v.*) have been brought to a high pitch of perfection and flexibility. Mathematical models have also reached great perfection, both for elementary teaching and for the demonstration of advanced concepts.

Electronic Computation.— Electronic computing devices fall into two great classes: machines employing 'digital'

methods, and instruments using 'continuous-variable' or 'analogue' methods. Those in the first class perform mathematical operations by counting electrical impulses, usually in the scale of two. Their mechanical ancestor is the abacus. Electronic machines can count at rates exceeding 1,000,000 per sec., working to ten or twenty decimal places, and incorporate electronic 'memory units' to enable them to receive information and select appropriate instructions at a corresponding rate. This makes it possible for them to organise the details of their own activity to a limited extent as calculation proceeds. In some respects they can be made to resemble human brains, but the popular term 'electronic brain' is a misnomer; most machines are designed to eliminate undesirable resemblances to



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A THREE-DIMENSIONAL GRAPH DRAWN ON THE CATHODE-RAY TUBE OF AN ELECTRONIC COMPUTING INSTRUMENT

the human brain as far as possible. Computing instruments rely on the measurement of some physical quantity, such as length or voltage, and are used where speed is more important than accuracy. Typical mechanical prototypes are the slide rule (*q.v.*) and the mechanical differential analyser (*q.v.*). Most electronic instruments rely mainly on the fact that the voltage across a resistance is proportional to the current flowing, while that across a capacitance is proportional to the time-integral of current. Voltages representing variables can thus be added, integrated, and so forth, according to the equation to be solved, and the solution is provided in the form of a graph. Present-day instruments can produce several thousand solutions per second, and use cathode-ray tubes to display them in graphical form. See also separate subjects referred to in this article, and CALCULUS; INSURANCE; INVOLUTION; LOGARITHMS; MAXIMA AND MINIMA; SLIDE RULE.

See H. Poincaré, *La Science et l'Hypothèse*, 1903; A. N. Whitehead, *Introduction to Mathematics*, 1911; W. W. R. Ball, *A Short Account of the History of Mathematics*, 1912; B. Russell, *Introduction to Mathematical Philosophy*, 1917; F. Cajori, *History of Mathematics*, 1919; T. L. Heath,

History of Greek Mathematics, 1921; D. L. Garret, *Story of Mathematics*, 1926; T. E. Peet, *Mathematics in Ancient Egypt*, 1931; F. Goursat, *Les Mathématiciens et la réalité*, 1936; L. Hogben, *Mathematics for the Million*, 1937; A. C. Aitken, *Statistical Mathematics*, 1942; T. H. Ward Hill, *Mathematics*, 1948; J. Degrazia, *Maths is Fun*, 1949; M. Kraitchik, *Mathematical Recreations*, 1949; and D. R. Hartree, *Calculating Instruments and Machines*, 1949.

Mather, Cotton (1663–1728), Amer. divine and writer, b. at Boston, son of Increase M. He was ordained in 1684, and was a minister in Boston from that time till his death. He was a considerable linguist and a prolific writer. A firm believer in witchcraft, he entered vigorously upon the persecutions of the day. His *Memorable Providences relating to Witchcraft* appeared in 1689. Twenty executions took place at Salem in 1692. His works include *Magnalia Christi Americana* (1702), a collection of biographies and historical fragments dealing with New England church hist. See B. Wendall, *Cotton Mather: the Puritan Priest*, 1926, and R. P. and L. Bons, *Cotton Mather, Keeper of the Puritan Conscience*, 1928.

Mather, Increase (1639–1723), Amer. nonconformist divine, b. at Dorchester, Massachusetts, and educated at Harvard. In 1657 he came to England, and graduated the next year at Trinity College, Dublin. He returned to America, and was ordained at Boston in 1664. In 1680 he presided at the Boston Synod, and in 1683 was instrumental in procuring the refusal to give up the Boston Charter. From 1684 to 1701 he was president of Harvard College, and during that time came on seven missions to England. He wrote some religious treatises. See K. B. Murdoch, *Increase Mather*, 1925.

Mathew, Theobald (1790–1856), Irish priest and temperance reformer, b. near Cashel, joined the Capuchin Franciscans in Dublin, and took charge of a small chapel in Cork. In 1838 he signed the total abstinence pledge and advocated the policy all over Ireland, with remarkable results. In 1843 he came to London, and during 1849 and 1851 travelled in America. He worked energetically during the Irish famine. See memoir by J. F. Maguire, 1863.

Mathews, Charles (1776–1835). Eng. actor, b. in London and educated at Merchant Taylors' School. He made his bow in London in 1803, and acquired a reputation as a comedian. Having played long at Drury Lane and Covent Garden, he set up in management at the Adelphi Theatre in 1828. His memoirs were pub. in 1839. His son, Charles James M. (1803–78), also educated at Merchant Taylors', held a supreme place in the sphere of light comedy, and was especially successful in Fr. plays. See his life (2 vols.), ed. by Charles Dickens, 1879.

Mathews, Sir Lloyd William (1850–1901), Brit. naval officer and first minister of the sultan of Zanzibar, entered the R.N. by way of the *Britannia*, and served later on H.M.S. *London*. Following ser-

vice in the Mediterranean and on the W. African coast, he joined the E. African patrol in 1875. Sickened by what he saw of the slave trade he volunteered to train a force whose main purpose was to end it. The Admiralty consented, and in a few months M.'s African battalion, the first regular native force to be raised in E. Africa, was a smart and creditable body of men. This new force grew rapidly, chiefly owing to the unbounded influence exercised over it by M. In 1881 M. retired from the navy in order to take permanent service under the sultan of Zanzibar, with the title of 'General,' and gave the rest of his life to Zanzibar. When he died in 1901 he had served under five successive sultans, and from 1891, when Zanzibar became a Brit. protectorate, with a new constitution, he had filled the post of first minister. See Sir R. Coupland, *The Exploitation of East Africa, 1856–1890: the Slave Trade and the Scramble*, 1939.

Mathura, see MUTTRA.

Maticeo (*Arantia* or *Piper elongata*), shrub (order Piperaceae), the leaves of which yield a heavy pale green aromatic oil, and are used as a styptic.

Matilda, or Maud (1102–67), only daughter of Henry I. of England. Married to Henry V. of Germany, 1114. At his death in 1125 she returned to England. She married Geoffrey of Anjou in 1128. At the death of Henry I. (1135) she carried on an unsuccessful civil war with Stephen till 1142; her son afterwards ascended the Eng. throne as Henry II.

Matilda, Caroline, see CAROLINE MATILDA, queen of Denmark and Norway.

Matilda, Countess of Tuscany (1046–1115), daughter of Count Bouifa 111., came into vast estates at an early age. She was twice married: to Godfrey V. of Lorraine and to Welf V. of Bavaria. Her life was spent in support of the popes against the emperor of Germany in the struggle over investiture. In 1074 she aided the pope against the Normans, and in 1077 Henry IV. underwent his humiliating penance before Gregory VII. at her castle of Canossa. Her estates were given to the Holy See in 1077, and the grant was renewed in 1102. See life by N. Grimaldi, 1928.

Matin, Le, Paris daily paper, founded in 1881 by Alfred Edwards as a Moderate Republican jour., devoting itself rather to the pub. of news from all over the world than to the propagation of political views. It pub. trans. of most of the telegrams in the *London Times*. It always opened its columns to all shades of opinion, whether republican, radical, or Bonapartist. Among its contributors were Emmanuel Arène, Gruner de Cassignac, Cornély, Vallès, Rane, Jules Simon, Des Houx, and Scholl.

Matins, see BREVIARY.

Matisse, Henri (b. 1869), Fr. painter, b. at Le Cateau, Nord. He left Amiens as a young man to study law in Paris, but soon gave up the idea of a legal career to begin his artistic life as a pupil of Gustave Moreau at the Ecole des Beaux Arts. Early attracted to the Impressionist

movement, his work in 1898 was similar in technique to the *intimiste* paintings of Sickert and Bonnard. Thenceforward, however, he came completely under the influence of Gauguin, and was soon to become one of the foremost leaders of the Fauvistes. A better draughtsman than Gauguin, M. has much in common with E. painting, and his clear washes or planes of pure colour, as opposed to the mosaic method, achieve the maximum of expression with an astonishing economy of means. In their emphasis on linear design, many of his pictures are masterly in their summary expression of form and rhythm. Pictures like 'The Dance' — consisting of brick-red dancing figures in the nude against a background of raw blue

Derwent valley, and is surrounded by mt. scenery. It has famous hot springs and in the neighbourhood are stalactite caves, petrifying wells, and lead mines. Adjoining M. to the S. is M. Bath, with numerous hydropathic estabs. Combined pop. 18,100.

Matopos, or Matoppo, range of hills in the Matopo dist. The Matopo area is a mass of compact hills, some of which approach in size the dignity of mts. The range extends for some 50 m. E. to W. and 25 m. N. to S. The highest point is on the N.E. of the range (5100 ft.). The chief hills are Sotja, Impu, Solozi, and Injelele. Many of the hills are associated in the Karanga mind with anct. racial traditions, some being 'venerated hills,' others



Canadian Pacific

THE TOMB OF CECIL RHODES IN THE MATOPO HILLS

and green — if anarchic in conception, are essentially expressive of life and movement; and the same observation applies even to those of his paintings such as 'The Toilet,' where there is undoubtedly some distortion of form. Among his other best-known paintings are 'Desserte,' 'Italienne,' 'Odalisque,' 'Femme au Turban,' 'Le Jeune Marin,' 'Les Trois Seurs,' 'La Musique,' 'Torse des Jeune Fille,' and 'Fenêtre à Tanger.' A large number of his canvases are in the Moscow State Collection of W. Art and in the various art museums of Europe and America. *Six studies* by E. Faure, 1920; R. Fry, 1930; R. H. Barr, 1932; A. C. Barnes and V. de Mazia, 1933; P. Courthion, 1942; and J. Cassou, 1948; also F. Careo, *L'Ami des peintres*, 1944.

Matiya, tn. of prov. Asyut, upper Egypt, on l. b. of Nile, 129 m. S. of Cairo. Pop. 7000.

Matlock, tn. of Derbyshire, England, on R. Derwent, 15 m. N.W. of Derby. It is picturesquely situated on the slope, and at the bottom of the narrow and beautiful

'ram dance hills.' One was named by Cecil Rhodes 'The View of the World,' now commonly called 'The World's View,' and was chosen by him as his burial-place. Here there is a national park and the Matopo dam, which irrigates the surrounding area. The Bushmen, the first human inhabit. of the country, made their homes in the inaccessible parts of the Matopo range from a dimly remote past in post-Neolithic times down to a few centuries ago. Rock paintings have been discovered. One of the chief points of interest is the phenomenon called the 'natural wall,' consisting of a dyke of diorite stone running from N. to S. through the centre of the range. Further in the range is the cave of the M'Rimo Priest, round which for centuries have hovered the religious ideas and superstitions of the Karanga. Injelele ('the slippery-sided') Mt., a conspicuous ln. mark and believed to be the third highest hill in the M., marks the locality of the cave, which, however, is not in the mt. itself. The M'Rimo was but a spirit, an ancestral shade, and dates from

the mid sixteenth century. It was, and still is, held to have the power of causing death, illness, and failure of crops or other injuries. Fear of evil consequences alone induced the natives to consult its oracle. The Matabele consulted it prior to their rising in 1896. The M. were the scene of sev. battles during this rebellion, as well as of the 'indaba,' in which Rhodes persuaded the chiefs to make peace.

Matriarchy, 'mother-rule,' is government by the mother or mothers. Various writers have recorded the existence of M. in primitive tribes, but Ofenbach (1861) claimed that in such cases 'mutter-recht' (mother-right) would describe more accurately the basis of organisation, since there was insufficient evidence to show that any society was truly matriarchal, whereas considerable evidence supports the theory of 'mother-right.' Most recent investigators uphold this view. Perhaps one of the nearest approaches to M. existed in early Egyptian hist., when women went about freely and followed industrial and commercial occupations, while the husbands stayed at home. Both married and unmarried women had power to dispose of their property as they wished and to get legal aid, but records do not show that the system of society was matriarchal. Iroquois women were represented in public councils and voted for war or peace. They ruled in the house, but performed the most menial tasks considered derogatory by the men, and the social status of the sexes was different. No recent civilisations are matriarchal, although their laws may retain vestiges of the influence of 'mother-right.' In the more primitive societies a few elements of a matriarchal system may be found, but no one society is known in which all the elements existed. Instances of matrilineal descent and inheritance are common, but usually the mother had no more power than in a patriarchal society. The position of authority was generally held by the mother's brother, the mother herself occupying a subordinate position. Among insects the bee colony is often cited as a typical M., but the queen bee has comparatively little freedom of action, and the hive is ruled mainly by sexually atrophied females, the workers. See L. H. Morgan, *Ancient Society*, 1877; L. T. Hobhouse, *Morals in Evolution*, 1906; E. A. Westermarck, *Sociological Papers*, 1906, and *The Origin and Development of Moral Ideas*, 1906-8; R. Briffault, *The Mothers*, 1927; L. T. Hobhouse, G. C. Wheeler, and M. Ginsberg, *The Material Culture and Social Institutions of the Simpler Peoples*, 1913; and J. H. Ronhaar, *Woman in Primitive Mother-right Societies*, 1931.

Matricaria, genus of composite plants with leaves much divided into narrow segments, and white ligulate ray florets in a single row. *M. chamomilla* is the wild chamomile.

Matriculation (Lat. *matricula*, a public roll or register) denotes the entry or admission to membership in a body or society, especially in a college or univ. The term is most often used for the M. examination, or preliminary examina-

tion which (or a prescribed equivalent) must be passed by candidates for any degree in London and various other univs. in the United Kingdom. (The London M. is the best known and most widely taken of these examinations.) Candidates for any degree in the univ. of London, unless admitted as postgraduate students proceeding to a master's or higher degree, must matriculate at least three years before entry to the final examination for a bachelor's degree. In order to matriculate a candidate must pass either one of the three examinations conducted by the univ., viz. (i.) the M. examination; (ii.) the general schools examination; (iii.) the special univ. entrance examination, or one of the examinations accepted by the univ. in lieu of the M. examination. No person may matriculate in London Univ. unless he or she has completed his or her sixteenth year of age. A number of qualifications are recognised as giving exemption, such as the higher certificate of the Oxford and Cambridge schools examination board. Except in the case of holding a higher certificate the student must have passed with 'credit' at one and the same examination, in various specified subjects, with, however, a wide range of alternatives. The Joint M. Board of the univs. of Manchester, Liverpool, Birmingham, Leeds, and Sheffield accepts the school certificate of the general schools examination as exempting from its own M. examination, provided that the candidate has passed with 'credit' in various subjects. M. has become a recognised standard for employers of clerical labour.

Matrimony, see MARRIAGE.

Matrona, see MAINE.

Matsui, quasi-monopolistic organisation which, together with others, especially the Mitsubishi, dominated Jap. industry, shipping, and banking before the Second World War. The Mitsubishi (originally Takahashi), a Jap. family connected with the great families of Fujiwara and Minamoto, was founded in the seventeenth century by Takatoshi M. After the restoration of 1868 (see JAPAN, History) the M. accumulated great wealth, and extended their activities to banking, insurance, and shipping. The M. and the Mitsubishi wielded considerable power, especially during the brief period of political party rule which flourished from 1920 to 1930 under their influence. To some extent the relatively liberal foreign policy of that decade was due to the international outlook of the M. and Mitsubishi, which derived from their interest in international trade and finance. Yet even at the zenith of their influence these economic leaders and others were so few in number and were indeed so closely interrelated with the bureaucracy that they were essentially agents for carrying out a national economic policy, subject to a control which, even if at times it was loose and partial, was easily intensified when war preparations demanded the completion of a totalitarian structure. The Sumitomo clan, descended from a remote emperor, was another instance of successful aristocratic incursion into industry and com-

merce. Even the house of Mitsubishi, the creators of the Jap. mercantile marine, though they might be *nori homines*, were closely connected with the Marquess P. Okuma, one of the foremost figures in the revived empire of the latter part of last century. See O. D. Russell, *The House of Mitsui*, 1939, and Sir G. Sansom, *Japan* (Oxford Pamphlets on World Affairs, No. 70), 1944.

Matsukata, Prince Masayoshi (1835-1924), Jap. statesman, b. in Satsuma. He was minister of home affairs, 1880; minister of finance, 1881; Premier, 1891-1892; again minister of finance in 1895; Premier and minister of finance, 1896; and again minister of finance, 1898-1900. After the war with Russia he was made marquess, and, on retiring from public life in 1922, he was made prince.

Matsumai, see FUKUYAMA.

Matsumoto, tn. of Honshu, Japan, 115 m. W.N.W. of Tokyo. It is a trading centre, and has the remains of an old castle. Pop. 73,300.

Matsuoka, Yosuke (1880-1916), Jap. statesman, b. at Yamaguchiiken. Graduating from the Oregon Univ. law school in 1900 he became secretary to the Jap. premier, 1919; secretary to the Jap. delegation to the Versailles peace conference, 1919; managing director of the S. Manchuria railway company, 1921, becoming vice-president in 1927 and president in 1935 until 1939. He led the Jap. delegation to the League of Nations, 1929, and at the meeting of the League Assembly in Geneva, 1932, he conducted the case for the approval of Jap. policy in Manchuria (Manchukuo); though he lost the day he enhanced his prestige in his own country. He was foreign minister, 1940-41, in which capacity he conducted the negotiations through which Japan joined the Axis (*q.v.*), and signed a pact of non-aggression with the Soviet Union. In the Jap. House of Representatives (of which he was a member from 1932) in Feb. 1941 he declared his belief that the white race must cede Oceania to the Asiatics. He was replaced in the reorganisation of the Jap. Cabinet during the war. Arrested as a war criminal in 1946, he d. in hospital.

Matsushima, or **Shiogamo-no-Matsu-shima**, pine-clad archipelago in Sendai Bay, E. coast of Shikoku, Japan, famous for its beauty.

Matsuya, tn. of Shimane prefecture, Hondo, Japan, near W. coast, with paper manuf. Pop. 52,000.

Matsuyama, tn. of Shikoku, Japan, 155 m. S.W. of Koto. Its port, Mitsu, 4 m. distant, is on the Inland sea. Pop. 81,900.

Matsuzaka, tn. of Honshu, Japan, 58 m. S.E. of Kioto. Pop. 14,000.

Matsys, or **Massys**, **Quintin** (1466-1530), Flem. painter, b. at Louvain, supposed to have been a blacksmith. In 1491 he became a member of the guild of St. Luke in Antwerp. His work is mainly religious, but includes some fine portraits, and is marked by smoothness and reverent feeling, together with a lack of atmosphere and a certain exaggeration of gestures indicative of character or emotion. His

most famous work is the triptych, 'Pieta,' now in Antwerp Museum. His 'Crucifixion' is in the National Gallery. See life by M. J. Friedlander, 1929.

Mattawa, tn. of Nipissing co., Ontario, Canada, at the confluence of the M. and Ottawa Rs. It is a centre for lumberers and trappers. Pop. 2000.

Matte, in metallurgy, an intermediate product in refining sulphide ores of copper, nickel, and lead. It contains from 30 to 40 per cent of sulphur, which is subsequently removed. Alternatively known as regulus.

Matteawan, vil. of Dutchess co., New York, U.S.A., 1 m. E. of the Hudson R.; it has a state hospital for the criminal insane. Pop. 7000.

Mattioli, Tito (1841-1914), It. composer, b. near Naples; became prof. in the Santa Cecilia Academy, Rome, in 1858, and after leaving the Continent settled in London in 1865, and became conductor at Her Majesty's Theatre. His work includes popular operas, ballets, and piano-forte music.

Matteotti, Giacomo (1885-1924), It. Socialist politician, b. at Fratta Polesine, in Rovigo. Member of the It. Chamber of Deputies, he became prominent in 1921, after Giolitti had accepted Mussolini as an ally in order that the Fascist bands might intimidate the workmen of Turin and the Venetian peasantry. M. began to reorganise a Unitary Socialist party, of which he was secretary, on a constitutional and parl. basis in accordance with the commonsense view of the rank-and-file Socialist trade unions. This clear sighted action helped the country to settle down, a result abhorrent to Mussolini, who, now ultra-nationalist and a renegade from republicanism, was preparing a *coup d'état* with the monarchy and the army. Having, after the 'march on Rome' (1922), acquired control of the state machine, he proposed and carried through the Chamber an electoral 'reform,' by which the strongest party was to have two-thirds of the seats. In the elections which were held in the following year the intimidation was tremendous. Mussolini naturally obtained his majority, but there were nearly 3,000,000 voters out of over 7,500,000 who had enough courage to vote against him, and when the Chamber met M. protested against Fascist outrages, and was thereupon murdered with unblushing brutality on June 10, 1924. This crime, the worst blunder of Mussolini and his associates by reason of its unending repercussions, in which at least De Boni (*q.v.*) and Finzi (minister of the interior) were involved, brought about a crisis in Fascism, though one which was so little understood abroad that, when the Council of the League of Nations met in Rome towards the end of the year, Mussolini was able to exploit Austen Chamberlain's cordiality to the advantage of his regime. See further ITALY, History.

Matter: In philosophy, according to the scholastics following Aristotle, was classified as *materia prima* (first matter) and *materia secunda* (second matter). The former is that of which a thing is

made and is determined by the substantial form, for example, according to a commonly received opinion, first matter in man (wrongly called the body) is determined by the rational soul. First matter is the subject of all corporeal change and the principle of extension and quantity. Substantial form determines it, places it in a determinate species, gives it its specification and actualisation; and only through its substantial form can it be known. Second matter is determined by an accidental form (*e.g.* roundness, redness, hardness, etc.), and is therefore an already constituted body. Metaphysicians to-day define M. as one of the ultimate principles or substances, in a dualist system, of which phenomena are appearances or manifestations or, in materialistic monism and materialism, the sole substance in terms of which the universe is ultimately to be explained. In this sense M. is unknowable; it underlies the properties of all particular things in which those properties inhere or by which, regarded as impressions made on the senses, they are caused; and it is the substratum of such qualities, supposed to be necessary to explain their constant co-existence as a group. The Eng. empiricists Locke, Berkeley, and Hume minimised or denied the importance of the conception of substance itself; but Kant retained the notion of M. as signifying the permanent which is found throughout all change. Modern phenomenalists, in so far as they recognise the concept of substance, and consequently of M., at all, regard it as denoting the unknown existent upon which physical properties somehow depend. See W. C. D. Whetham, *Matter and Change*, 1924, and E. I. Watkin, *A Philosophy of Form*, 1935. 2. In physics, is the name given to that out of which all objects external to the mind are thought to be composed. The physicist is concerned with the explanation of the phenomena of nature, and the ultimate goal of his researches is an interpretation of the physical nature of M. that will be consistent with the laws of natural phenomena. The earliest theory of M. of any importance is that of Democritus and Lucretius, who supposed that M. consists of hard atoms (Gk. ἀροτα—uncuttable) that could neither be created nor destroyed nor altered in any way. Experimental evidence that supported such a theory, modified in some respects, was forthcoming at the beginning of the nineteenth century when Dalton's chemical researches led to the discovery of the law of multiple proportions. He discovered that in chemical combinations, elements combine in certain definite proportions by weight. If a given element really consisted of identical atoms, and if n atoms of one element always combined with m atoms of another given element, then the macroscopic result would lead to Dalton's result. This hypothesis has been very fruitful in explaining chemical phenomena, and it has had a similar success in the realm of physics. Thus the kinetic theory of matter, by postulating the existence of atoms and groups of atoms, called molecules, has been able to account quanti-

tatively for the physical law of gases, liquids, and solids by a statistical inquiry into the motions of these molecules. The success of this theory can be appreciated by reading Sir Wm. Bragg's book, *Concerning the Nature of Things* (1927). A quasi-philosophical interpretation of the atom was forthcoming when Kelvin imagined it to be a vortex rising in the ether that permeated all space. Electrical research initiated by J. J. Thomson in the last decade of the nineteenth century carried the investigations a step further. While the atom of Dalton was the 'ultimate particle' in chemical reactions, it proved to be 'cuttable' by electrical means, for the existence of an electron, a particle carrying a negative charge of electricity, whose mass was less than that of the lightest atom, the atom of hydrogen, was established, and its mass and electrical charge determined by Millikan in 1908. Rutherford's researches in radioactivity, supported by the researches of Moseley and others, gradually established the electrical theory of M. According to this theory all M. is composed of elementary positive charges of electricity called protons, and negative charges called electrons. In 1913 Bohr deduced the result that the atom of hydrogen is an elementary solar system, with a proton for its sun and an electron as the sole planet. The quantitative success of this model, together with experimental evidence concerning the essentially similar nature of other atoms, too complex to yield a mathematical solution of their solar systems, seemed to lead to the conclusion that M. had at last been reduced to its simplest term. The problem is, however, more complicated to-day. Difficulties that were adumbrated by the theory of relativity have materialised in a spate of fresh experimental evidence. A new theory of light has arisen; it involves a new theory of M. Annihilation of M., formerly supposed to be impossible, is taking place at such a rate that the sun alone is losing something of the order of 250,000,000 tons a min. in the form of photons or light corpuscles. Radiation, as well as the 'hard particles' known as electrons and protons ten years ago, 'exhibit a dual nature,' to quote Sir James Jeans, who in *The Mysterious Universe* (1930) sums up the state of knowledge as follows: '... the tendency of modern physics is to resolve the whole material universe into waves and nothing but waves. These waves are of two kinds: bottled-up waves, which we call M., and unbottled waves, which we call radiation or light. If annihilation of M. occurs the process is merely that of unbottling imprisoned wave energy and setting it free to travel through space.' Following the work of Einstein and Eddington, theories on the nature of M. have been put forward by E. A. Milne, H. Weyl, F. Hoyle, and others. See also ATOM AND ATOMIC THEORY. See Sir A. S. Eddington, *Stars and Atoms*, 1927; Sir J. Jeans, *The Stars in their Courses*, 1931; and E. A. Milne, *Relativity Gravitation and World Structure*, 1949.

Matterhorn, or Moft Cervin, peak of the

Pennine Alps, in the central zone of the Middle Alps, on the borders of Valais, Switzerland, and Piedmont, Italy, 6 m. S.W. of Zermatt. Altitude 14,775 ft. Its appearance is most striking owing to its isolation and unusual steepness. The ascent by the N.E. or Zermatt ridge was first made in 1865 by Whymper, Lord Douglas, Hudson, and others, when six of the party lost their lives. Subsequently it was climbed by the It. ridge, the Zmutt ridge, and the N. face, and ultimately by all four ridges and faces. All routes are very difficult, especially in bad weather, but there are fixed ropes on the N.E. and It. ridges, which lessen the standard of climbing required, and reduce the risks to a minimum. See E. Whymper, *The Valley of Zermatt and the Matterhorn*, 1901, and G. Rey, *The Matterhorn*, 1947.



F.N.A.

THE MATTERHORN FROM ZERMATT

Matthay, Tobias (1858-1945), Eng. pianoforte teacher, b. in London, founded the M. school in 1900. He was a prot. of piano at the Royal Academy of Music. His system is founded on observation of the operation of both physical and psychological laws, and is described in *The Art of Touch* (1903). Among many famous pupils may be mentioned Harriet Cohen, Myra Hess, Irene Scharrer, and York Bowen.

Matthew, Basarab (d. 1654), hospodar of Wallachia. He came to the throne in 1633, and ruled with much wisdom. Among his reforms were the estab. of a printing press (1632), the codification of the law, and the trans. of the Bible into Wallachian.

Matthew of Paris, see PARIS, MATTHEW.

Matthew of Westminster, legendary fifteenth-century Benedictine monk and chronicler, to whom the *Flores historiarum* was formerly assigned. This MS. was probably compiled by various writers at St. Albans and Westminster. It was first printed by Archbishop Parker in 1567, trans. by C. Yonge in 1853, and ed. by H. R. Luard in the Rolls Series, 1890.

Matthew, the Gospel according to St. First book of the N.T. The tradition

which attributes the authorship to St. M. is founded on the words of Papias that 'Matthew composed the oracles (*λογία*) of the Lord in the Hebrew tongue and each interpreted them as he was able.' This cannot refer to our gospel, for it is certain that this work is an original Gk. composition, and not a trans. from the Heb. or the Aramaic. Some have therefore been led to doubt the veracity of Papias, but this is rendered unnecessary by the very probable theory as to the 'oracles of the Lord' (see LOGIA). Our gospel seems to have been composed from the two main sources: (1) St. Mark's Gospel, or the earlier form of it known as the *Ur-Markus*; (2) a source common to St. M. and St. Luke, known as Q. It is extremely difficult to secure a probable date for the first gospel. Harnack dates it from A.D. 70 to 75, except certain later additions. Previous critics had also generally placed it in the last quarter of the first century. It is almost certain that St. M. was not its author. The gospel is characterised first by the number of its quotations from the O.T., emphasising the Messianic character of Christ's work, secondly, by its arrangement of the subject-matter in groups. Thus we have a collection of discourses in chaps. v.-vii., of miracles in chaps. viii. and ix., of parables in chap. xiii. Much more attention is given to our Lord's discourses than in the Marcan narrative. See commentaries by T. Zahn, 1903; W. C. Allen, 1907; F. Maeder, 1919; and article in J. Hastings's *Dictionary of the Bible*, 1898, where full bibliography is given.

Matthews, James Brander (1852-1929), Amer. man of letters, b. at New Orleans and educated at Columbia College, New York. A founder of the Amer. Copyright League, the Dunlap Society, and the Simplified Spelling Board, he became president of the Modern Language Association of America in 1910. His pub. works, comprising fiction, criticism, drama, etc., include *French Dramatists of the Nineteenth Century* (1882); *Vignettes of Manhattan* (1894); *Introduction to the Study of American Literature* (1896); *Aspects of Fiction* (1896, 1902); *Tales of Fantasy and Fact* (1896); *Molière, his Life and his Works* (1910); *A Book About the Theatre* (1916); *The Principles of Playmaking* (1919); and *The Playwrights on Playmaking* (1923).

Matthews, Walter Robert (b. 1881), Brit. divine; educated at Wilson's College, Camberwell, and King's College, London. He was successively curate at St. Mary Abbots, Kensington, and at St. Peter, Regent Square, London; lecturer in philosophy, King's College, London, 1908-18, and in dogmatic theology, 1909-18; dean, 1918-32; vicar of Christ Church, Crouch End, London, 1916-18; canon theologian, Liverpool cathedral, 1930; chaplain to the king, 1923-31; Boyle lecturer, 1920-22; Warburton lecturer, 1933; dean of Exeter, 1932-34; and of St. Paul's, in succession to Dr. Inge, 1934. His publs. include *Studies in Christian Philosophy* (1921; 2nd, 1928); *The Psychological Approach to Religion* (1925); *God in Christian Thought*

Matthias

and Experience (1930; 6th ed., 1942); *The Adventures of Gabriel in his Search for Mr. Shaw* (1933); *Essays in Construction* (1934); *The Purpose of God* (1935); *Hope of Immortality* (1937); *Signposts to God* (1938); *Moral Issues of the War* (1940); *The Foundations of Peace* (1942); and *Strangers and Pilgrims* (1945).

Matthias Corvinus (1443-90), king of Hungary, b. at Khausenburg (Kluj), the son of John Hunyadi; elected king in 1458. He was not crowned till 1464, after a long struggle against the Turks, the Bohemians, Emperor Frederick III., and hostile factions at home. His reign was marked by a series of wars. In 1468 he conquered Bosnia, and in 1468-69 Moldavia and Wallachia, and in 1473 concluded a peace with Ladislaus of Bohemia, by which he gained Moravia, Silesia, and Lusatia. In 1485, during a war with Frederick III., he captured Vienna and made himself master of much of Austria. He was a great military tactician and a prudent but arbitrary ruler. He was a liberal patron of learning, and founded the univ. of Budapest and a fine library.

Matthiola, genus of cruciferous herbs or shrubs which has given rise to various valuable garden plants, including the ten-week, night-scented, Brompton, queen, and wallflower-leaved stock. *M. incana* and *M. sinuata* are Brit. natives.

Matthisson, Friedrich von (1761-1831), Ger. poet, b. in Hohenodeleben, near Magdeburg. From 1781 to 1784 he was prof. of economics at Dessau. In 1787 he pub. his poems, which were praised by Schiller and Wieland. A collected ed. of his writings was pub. in Zurich (1825-29, 8 vols.). See lives by H. Doring, 1833; W. Krebs, 1912; and A. Heers, 1913.

Mattingly, Harold (b. 1884), Eng. historian and authority on Rom. coinage, b. at Sudbury, in Suffolk. From 1910 to 1918 he was assistant keeper of the dept. of coins and medals at the Brit. Museum, and from 1942 to 1948 president of the Royal Numismatic Society. Among his very numerous publs. are *Imperial Civil Service of Rome* (1909); *Coins of the Roman Empire in the British Museum* (vols. i-iv, 1923-40); with E. A. Sydenham and C. H. V. Sutherland, *Roman Imperial Coinage* (vols. i-v, 1923-49); *Roman Coins* (1928); he also ed. the *Numismatic Chronicle*.

Mattioli, Count, see under IRON MASK, THE MAN IN THE.

Matto Grosso (*Cuyabá*), interior state of Brazil. The Rr. Madeira, Parana-Paraguay, Araguaia, Napoare, and Tapajos form its boundaries, and it is also watered by the Xingu R. The greater part is a plain, much of which is densely wooded, while there are also large swampy areas. Several ranges of low mts. traverse the centre, and are rich in minerals, including diamonds. The prov. is little known and scarcely inhabited. Rubber is the chief export, and sugar, tobacco, coffee, and maté are also produced. Cap. *Cuyabá*. Area, 532,210 sq. m. Pop. (estimated) 368,200. It contains a tn. of the same name, formerly an important mining centre. Pop. 1000.

Maude

Mattoon, city of Coles co., Illinois, U.S.A., 50 m. W. of Terre Haute. It has foundries and machine shops. Pop. 15,800.

Maturin, Charles Robert (1782-1824). Irish novelist and dramatist, b. in Dublin, wrote sev. plays, one of which, a tragedy, *Bertram*, was produced by Kean at Drury Lane in 1816. He is best remembered as the author of the novels *Montario* (1807) and *The Mysterious Chief* (1812), both of which won praise from Scott, and especially *Melmoth the Wanderer* (1820), which was his masterpiece. See his letters to Lady Ewan-Smith (ed. J. Brumforth, 1927) and life by N. Idman, 1924.

Maturin, cap. of the state of Monagas, Venezuela. 10 m. inland from the gulf of Paria. It has a wireless station. Pop. 7000.

Mau: 1. Tn. in the Azamgarh dist. of the United Provs., India, 55 m. N.E. of Benares. The chief manuf. is silk. Pop. 16,000. 2. Tn. in the Jhansi dist., United Provs., India, 117 m. S.W. of Cawnpore, and engaged in the manuf. of *kharua* cloth. Pop. 25,000.

Maubeuge, tn. in the dept. of Nord, France, on the Sambre. It is strongly fortified, has an arsenal, and manufs. glass and hardware. Taken by the Germans, Aug. 1914, it was recaptured by the Allies on Nov. 9, 1918. In the Second World War it formed one end of the salient caused by the Ger. advance in May 1940, and was captured after three days' heavy fighting. Pop. 20,800.

Mauch Chunk, co. seat of Carbon co., Pennsylvania, U.S.A., on the Lehigh R. At this spot the riv. flows through a deep ravine, and the tn., which is situated on the mt. slopes, attracts a number of visitors on account of its beauty. It is in the centre of a rich coal region. Pop. 3000.

Mauchline, tn. of Ayrshire, Scotland, on R. Ayr, 8 m. S.E. of Kilmarnock. It has many manufs. of fancy wooden articles, and a famous horse and cattle market. Burns lived at Mossgiel, 14 m. to the N.W. Pop. 2300.

Maude, Aylmer (1858-1938), Eng. writer, educated at Christ's Hospital and the Lyceum, Moscow. He helped to arrange the emigration to Canada of thousands of Donkobors, a Russian religious sect. In 1918 he visited Russia again, as a lecturer for the univs. committee of the Y.M.C.A. Although he wrote books on various subjects he will be remembered chiefly for his work as an interpreter of Tolstoy and as a translator of his books, a task for which he was well fitted by his knowledge of Russian and his friendship with Tolstoy. In 1908 he pub. the first vol. of his *Life of Tolstoy: the First Fifty Years*, the second vol. dealing with Tolstoy's philosophical period, appearing in 1910. He also trans. and ed. Countess S. A. Tolstaya's compilation, *The Final Struggle*, 1936.

Maude, Cyril (b. 1862), Eng. actor, b. in London, eldest son of Capt. Charles H. M. was educated at Charterhouse. He first appeared on the stage in Colorado in 1883 in *East Lynne*; and in 1884

returned to England, appearing at the Criterion Theatre, London, in 1886. He played in *The Great Divorce Case* and in the first performance of *The Second Mrs. Tanqueray* (1893). He was co-manager with Frederick Harrison at the Haymarket, London, 1896–1905, and in 1907 took over the management of the Playhouse, Northumberland Avenue. His first wife, Winifred Emery (q.v.), with whom he was long associated on the stage, d. 1924. His reminiscences were pub. in 1927.

Maude, Sir (Frederick) Stanley (1864–1917). Brit. general, b. at Gibraltar, son of Gen. Sir Frederick Francis M., V.C., G.C.B. Educated at Eton and Sandhurst. He joined the Coldstream Guards in 1884, and served in the Sudan, 1885; in the S. African war, 1899–1901. Early in the First World War he commanded the 14th Infantry Brigade, being wounded severely. Major-general in 1915. He commanded the 13th Infantry Div. in France, the Dardanelles, Egypt, and, in Aug. 1916, Mesopotamia. He was made lieutenant-general in 1917. He marched from Basra up the Tigris R. to Kut, and defeated the Turks at Shuruan, entering Bagdad March 11. See also under IRAQ, History, and MESOPOTAMIA, CAMPAIGN IN. See life by Sir C. E. Callwell, 1920.

Maudsley, Henry (1835–1918), Eng. physician, b. in Yorkshire, graduated as M.D. from Univ. College, London, in 1857. He was medical superintendent of Manchester Royal Lunatic Hospital, 1859–62; physician at the W. London Hospital, 1861–74; prof. of medical jurisprudence at Univ. College, London, 1869–79, and became Goulstonian lecturer at the Royal College of Physicians, 1870. He specialised in mental work and was editor of the *Journal of Mental Science* (1862–78). His numerous works include *Responsibility in Mental Disease* (1874); *Physiology of Mind* (1876); *Pathology of Mind* (1879); *Body and Will* (1883); *Natural Causes and Supernatural Seemings* (1886); *Life in Mind and Conduct* (1902); and *Heredity, Variation, and Genius* (1908).

Maugham, William Somerset (b. 1874), Eng. novelist and playwright, b. in Paris. Educated at the King's School, Canterbury, and Heidelberg Univ., he studied medicine, but in 1897 pub. his first novel, *Liza of Lambeth*, and the success of that novel and of *Mrs. Cradock* (1902) finally won him over to literature, though something of his hospital experience is reflected in the first of his masterpieces, *Of Human Bondage* (1915). With the pub. of *The Moon and Sixpence*, partly based on Gauguin's life (1919), his reputation as a novelist was assured. His success as a playwright developed at the same time, and in one period only Bernard Shaw had more plays running in London. One of his most successful plays was *Our Betters* (1923), a social satire performed in New York, 1917, and London, 1932. He has also written sev. vols. of short stories, those with a Malayan or S. Pacific background being particularly well known. His autobiography, notable for its self-revelations, *The Summing Up*, was pub. in 1938; and *A Writer's Notebook* in 1949.

His other plays include *Loaves and Fishes* (1911); *East of Suez* (1922); *Cesar's Wife* (1919); *The Unknown* (1920); *The Circle* (1921); and *The Sacred Flame* (1929). Other novels include *The Making of a Saint* (1898); *The Bishop's Apron* (1906); *The Painted Veil* (1925); *Ashenden* (1928); *Cakes and Ale* (1930); *Theatre* (1937); *The Razor's Edge* (1944); and *Catalina* (1948). See lives by R. A. Cordell, 1937, and R. H. Ward, 1937.

Maui, one of the Hawaiian group of is., situated about 26 m. N.W. of Hawaii. It consists of two peninsulas divided by an isthmus of sand, the E. one containing the volcano of Haleakala, over 10,000 ft. high and with a crater 20 m. in circumference. The chief tns. are Lahaina and Kahului. Area 730 sq. m. Pop. 45,300.

Maui (natives), see under MAORIS.

Maule: 1. Prov. of Chile, bounded on the W. by the Pacific Ocean. Area 2172 sq. m. Stock-raising and agriculture are carried on. Cap. Caquenes. Pop. 70,500. 2. Riv. of Chile, which flows into the Pacific Ocean near Constitucion. It is about 110 m. long.

Maumbury Rings, circular earth mounds situated + m. S. of Dorchester, England. They form a circle capable of holding 12,000 persons. Excavations carried out between 1908 and 1913 disclosed that the original work was an earthen circle, with an interior ditch, dating from the late Neolithic to Early Bronze Age (c. 1800 B.C.). In Rom. times the work was converted into the amphitheatre of the tn. of Durnovaria (Dorchester).

Mauna Kea, extinct volcano on the is. of Hawaii, 13,804 ft. high. It is the highest mt. of the Hawaiian is., and is snow-clad for the greater part of the year.

Mauna Loa, active volcano of Hawaii, the greatest in the world, erupting frequently. It lies S. of Mauna Kea, and is 13,706 ft. high.

Maundy Thursday, Thursday of Holy Week. The name is derived from *mandatum*, the first word of the service chanted at the washing of the feet of pilgrims on that day, which is taken from John xiii. 34. It was accompanied by a distribution of 'doles,' which were handed to the pilgrims in small baskets, thence called 'maunds.' The feet-washing part of the ceremony was carried out in varying degrees of faithfulness by kings, clergy, and monks until about the fifteenth or sixteenth century. James II. performed the rite personally. After this the lord high almoner was given the task, but the rite ceased about 1750. In 1838 the dole was replaced by a money payment (M. money) from the clerk of the Almony Office. Specially minted silver coins, introduced by Charles II., are still distributed. In Rom. Catholic churches holy oils are consecrated on this day.

Maounoury, Michel Joseph (1847–1923), posthumously marshal of France; b. at Maintenon (Eure-et-Loir). He served in the war of 1870, in the artillery, and later became prof. of artillery at St. Cyr, colonel in 1897, general of div. in 1905, and military governor of Paris, 1910. On the outbreak of the First World War he took command of three divs. in the Fourth

Army under Ruffey, and defeated an attempt to turn Ruffey's left, Aug. 24, 1914. In Sept., in command of Sixth Army of Paris, he engaged Kluck in the battle of the Ourcq, and forced him back. Wounded, March 1915, he again became governor of France later in the year. Retired March 1916.

Maupassant, Guy de (1850-93). Fr. novelist and poet, b. at the Château of Miromesnil, Seine-Inferiore; educated at Yvetot and Rouen. He entered the Ministry of Marine, and fought in the Franco-Ger. war. He early came under the influence of Flaubert, who assisted him with encouragement and advice. After about 1886 he gradually broke down in health and reason, and after attempting suicide in 1892, died in painful circumstances in Paris. As a novelist he was the last of the naturalists, and though marked by considerable limitations in thought and imagination, he was a master in the vivid and accurate reproduction of life which he himself had observed with a wonderful intensity. His style is simple, but most effective. As a writer of *contes* he began, in 1880, with a masterpiece, *Boule de Suif*, contributed to *Soirées de Médan*, a collection by Zola, Huysmans, and others. His best collections of short stories are *La Maison Tellier* (1881); *Mademoiselle Fifi* (1883); *Clair de Lune* (1883); *Miss Harriet* (1884); *Trette* (1884); *Toine* (1886); *La Petite Roque* (1886); *Mont-Oriol* (1887); *La Hora* (1887). His novels include *L'ne Je* (1883); *Bel-Ami* (1885); *Pierre et Jean* (1888); *Fort comme la mort* (1889); and *Notre Coeur* (1890). He also wrote *Contes de la Béresse* (1883); *Contes et Nouvelles* (1885); *Monsieur Parent*, and *Contes du jour et de la nuit* (1885); *Le Rosier de Madame Husson* (1888); and *Inutile Beaute* (1890), all collections of short stories; *Des Vers* (1880), a vol. of poems, and sev. books of travel. His complete works were ed. by L. Comard in 29 vols. (1908-10). See lives by P. Mahn, 1908; J. Rolland, 1921; E. Boyd, 1926; R. V. Steward, 1926; R. Dumesnil, 1935; and S. Jackson, 1938.

Maupertuis, Pierre Louis Moreau de (1698-1759), Fr. mathematician, b. at St-Malo, educated in Paris, and served for some time in the army. In 1723 he was elected to the Academy of Sciences, and in 1728 his ardent support of the theories of Newton led to his becoming a fellow of the Royal Society, London. In 1736 he was the head of a party of academicians, including Clairaut and Lemonnier, who were sent to Lapland to measure a degree of long. and succeeded in exposing the error made in the previous measurement of Dominic and Cassini. He pub. *Sur la figure de la terre* in 1738. In 1740 he went to Berlin, and was made president of the Academy of sciences. He wrote sev. treatises on geometry, arithmetic, and astronomical measurement. His theory of pessimism, described in *Essai de philosophie morale* (1749), was later developed by Schopenhauer, Hartmann, and others. See A. Le Sueur, *Maupertuis et ses Correspondants*, 1897; life by P. Brunet, 1930.

Maura, Antonio (1853-1925), Sp. states-

man, b. at Palma, Majorca, son of a manufacturer of leathergoods. Educated at a local secondary school and at the law school of Madrid Univ., he entered the Cortes in 1881 as Liberal representative of his native tn. Colonial minister under Sagasta in 1892, he succeeded to the Conservatives in 1901, becoming minister of the interior, 1902. Prime Minister seven times between 1903 and 1922, his ministries were short-lived, as he was autocratic and uncompromising. He was not friendly to France or England. He disapproved of the dictatorship estab. 1923.

Maur, St. Congregation of, society of reformed Fr. Benedictines. It was estab. about 1618 at St. Maur-sur-Loire, and as the movement spread the chief house was removed to St. Germain des Prés, Paris. The order, which was famous for its literary work, was suppressed at the revolution. It included Mabillon, Bonnet, Chardon, and other learned scholars among its members.

Maurepas, Jean Frédéric Phélieppeaux, Comte de (1701-81). Fr. statesman, b. at Versailles. At an early age he succeeded his father as secretary of state of the king's household, and in 1725 became superintendent of the Marine. In 1749 he offended Mme de Pompadour by an epigram, and was banished from court. In 1774, on the accession of Louis XVI., he was recalled and made first minister. He entirely remodelled the Marine dept., and was a liberal patron of art and science, but both Turgot and Necker were sacrificed to his ambition. His memoirs, by himself, are curious and carelessly written. They were printed at Paris in 1792.

'Mauretania,' The, see CUNARD STEAMSHIP LINE.

Mauriac, François (b. 1885), Fr. novelist and poet, b. at Bordeaux. Like Bernanos (q.v.) M. is anchored to the Rom. Catholic position, and is an observer of fallen humanity. His *Désert de l'amour* (1925), *Thérèse Desqueyroux* (1929), and *Le Cœur de ripères* (1932) give an excellent picture of the Catholic bourgeoisie, of the propertied classes in the S.W. of France. His *La Pharisaïenne* (1911; trans. *A Woman of the Pharisees*, by G. Hopkins, 1946) exemplifies this type. It is a concentrated study of a woman who intermeddles, with disastrous results, in the affairs of others in order to dominate them spiritually, and according to her own interpretation of what is right for them: who inevitably regrets her every 'altruistic' action as 'the cross laid upon the great-hearted in darkness and uncertainty on behalf of the spiritually mean and inferior'; and who only in the evening of her life comes to realise that 'it is not our deserts that matter, but our love.' M. is one of the most distinguished of Europe's contemporary novelists; yet outside a restricted and informed public his name was almost unknown to Eng. readers. Between 1947 and 1949, however, a great change came, though different reasons may be assigned for his popularity with different readers. What M. supplies is a moral fervour which was once a common feature of our literature, and perhaps it is

no mere coincidence that enthusiasm for his novels comes at a time which has seen the rehabilitation of George Eliot and Henry James. Perhaps his 'foreignness' also partly explains the success of his novels in this country; for they paint a world which, for most (especially non-Catholics) is more than usually strange; their setting is that of a Fr. prov. life in the most intensely personal and foreign aspect and the characters move in a closed circle of prejudice and intolerance which has no counterpart in the world we know (Gerald Hopkins). In *Thérèse* M.'s sense for situation and the tensity of his dialogue are worthy of a great tragic drama. An exceptional psychologist, M. is also a poet in his imaginative vision of landscape and of destiny. His other works include *Les Mains jointes* (verse, 1909) and *Adieu à l'adolescente* (poem, 1911); the novels *Le Baiser au Lépreux* (1922), *Gentrie* (1924), *Le Mystère Frontenac* (1933), and *Le Fleuve des feu* (1939); a life of Racine (1930); the dramas, *Assomée* (1937), *Les Malamées* (1943), and *Cahiers noir*, the first vol. of which was pub. 'underground' in 1942. See biographical study, with bibliography, by E. Rideau, 1945; also D. Saurat, *Modern French Literature*, 1946, and J. Majault, *Mauriac et l'a. du roman*, 1916.

Maurice, Sir Frederick Barton (b. 1871), Brit. major-general, eldest son of Gen. Sir John Frederick M. Entering the army in 1892 he served in Tirah, 1897-98, and the S. Africian war, 1899-1900. He was director of military operations, imperial general staff, 1915-18, and major-general 1916. In May 1918 he publicly denied the accuracy of certain ministerial statements as to army matters, and was retired for this breach of discipline. For the remainder of the war period he was a military correspondent. Principal of the Working Men's College, Camden Town, 1922-23, he became prof. of military studies at London Univ., 1927. Pubs. include *Forty Days in 1911* (1919); *Robert E. Lee the Soldier* (1925); *Governments and War* (1926); *British Strategy* (1929); *History of the Scots Guards* (1934); *Life of Lord Haldane* (2 vols., 1937-38); and *Adventures of Edward Wogan* (1945).

Maurice, Frederick Denison (1805-72), Eng. divine, b. at Normanstow, Suffolk, went to Cambridge Univ., and there assisted in founding the famous 'Apostles' Club.' Chaplain to Guy's Hospital, 1830-1840, in the latter year he became prof. of Eng. literature at King's College, London, and in 1845 Boyle lecturer and Warburton lecturer; but in 1853, at the request of the council, resigned both chairs after the pub. of his *Theological Essays*. He allied himself with the Christian Socialists and Charles Kingsley. In 1854 he took an active part in the foundation of the Working Men's College, of which he was appointed the first principal. The starting-point of his theology is God's redemption of man, and its centre is the reality of the Kingdom of God. His pubs. include *The Claims of the Bible and of Science* (1863) and *Moral and Metaphysical Philosophy* (1871-72). See lives by his son, 1884, and C. F. G. Masterman, 1907; also A. Vidler,

The Theology of F. D. Maurice, 1949.

Maurice of Saxony (1500-58), emperor of the Holy Rom. Empire and king of Spain. See under CHARLES V.

Maurice, Prince of Orange and Count of Nassau (1567-1625), son of William the Silent. On his father's assassination (1584) he became stadholder of Holland and Zealand provs., and of the seven United Provs. (1587). He showed himself a capable general, capturing Breda, Zutphen, and Nimeguen (1590-91), and expelling the Spaniards, who were compelled to acknowledge the United Provs. as a free republic, and conclude a twelve years' truce (1609). The struggle was renewed (1621), and while negotiating an alliance with England and France M. d. See also NASSAU, HOUSE OF, and ORANGE. See G. van Prinsterer, *Maurice et Barneredt*, 1875.

Mauricianus, Junius, Rom. Jurist, fl. it seems, in the days of Antoninus Pius. He wrote *Ad Leges*, and his authority is four times cited in the *Digest*.

Maurier, George Louis Palmella Busson and **Sir Gerald Du**, see DU MAURIER.

Maurists, see MAUR, ST., CONGREGATION OF.

Mauritania, colony of Fr. W. Africa, between Lower Senegal and Rio del Oro. Its N. limits are not strictly defined, but its area is estimated at 324,000 sq. m. Formerly a protectorate, it became a colony, under the administration of a lieutenant-governor, in Dec. 1920, represented by one member each in the National Assembly, Council of the Republic, and Assembly of the Fr. Union. Consisting mainly of sandy desert, it is the least productive of France's W. African colonies; some gum, dates, and cotton are produced, and sheep are reared. Pop. 492,600, comprising nearly 400,000 Muslims, about 92,000 other natives, and about 520 Europeans.

Mauritia, genus of tall S. Amer. palms with fan-shaped leaves.

Mauritius (formerly *Île-de-France*), is of the Indian Ocean belonging to Great Britain, lies in lat. 19° 58' to 20° 33' S., and long. E. from Greenwich 57° 17' to 57° 16'. It is 39 m. from N. to S., and 129 m. from E. to W., and has an area of 720 sq. m. The surface is of varied formation, a great portion being volcanic, while its coast is fringed by extensive coral reefs pierced in sev. places by the estuaries of small streams. Its mts., although of no great height, are marked by the usual irregularities observed in volcanic formations. Of these the most celebrated is the P'tre Botte, situated in the rear of the tn. of Port Louis, and forming a remarkable cone, sustaining on its apex a gigantic piece of rock which has the appearance of being poised upon its summit with the nicest precision. The climate is very moist and tropical, especially at sea level, and the European residents live mostly in the hill dists., especially at Curepipe (1800 ft.). The prin. tns. are Port Louis (66,800), the cap., and Grande Port or Mahébourg, the S. port, the latter difficult of access for shipping and much encumbered with coral reefs. Port Louis has a spacious harbour. Its greatest industry is

sugar, and most of its accessible surface is covered with sugar plantations. Owing to depression in sugar prices and the competition of beet sugar the Mauritians have latterly taken up supplementary industries, such as aloes, rum, copra, coconut oil, tea, and tobacco. Apart from Hindus the people are mainly of French descent, and there are also many mixed Indian and African peoples. A new constitution for M. was promulgated in 1947. The legislature consists of the governor as president, three *ex-officio* members, twelve nominated members, and nineteen elected members. The executive must include four members selected by the legislature.

M. was discovered in the year 1505 by the Portuguese commander, Don Pedro Mascarenhas. Later it was colonised by the Dutch, who named it M. after their stadholder, Count Maurice. In 1710 the Dutch abandoned the is., which was then taken over by the Fr. India Company and named Ile-de-France. About this time, the Fr. also colonised the is. of Réunion, then called Bourbon. In 1735 they sent to M. its most famous governor, Mahé de la Bourdonnais, and the is. owes its later prosperity largely to his energy and foresight. He founded Port Louis, built roads and forts, cleared forests, and introduced the sugar-cane. In 1767 the is. passed to the Fr. Crown and, in the Napoleonic wars, was used as a base against the Brit. merchantmen. Accordingly the Brit. sent out an expedition from India, which captured the is. in 1810. By the treaty of Paris the Ile-de-France was ceded to Britain, and its original name M. was restored. The Fr. laws and customs, however, together with the language and Catholic religion, were not disturbed, and M. remains largely Fr. in character to this day. There are various scattered is. dependencies, including Rodrigues, with a pop. of 10,000, and the Chagos archipelago. M. has suffered much from hurricanes, notably in 1931. Pop. 428,300, including over 300,000 Hindus. See E. Hitié, *Histoire de Maurice*, 1897; A. Pitot, *L'Ile de France: esquisses historiques*, 1910; J. A. Duclos, *L'Évolution Nationale Mauricienne* (Paris), 1921; R. Philogène, *The Island of Mauritius*, 1928; and W. H. Ingrams, *Short History of Mauritius*, 1931.

Maurois, André (b. 1885) (pseudonym of Emile Herzog), Fr. writer, b. at Elbeuf. He became known to Eng. readers through *Les Silences du Colonel Bramble* (1918). Other works of his, many of them also on Eng. themes, are *Ni ange, ni bête* (1919); *General Bramble* (1921); *Les Discours du Docteur O'Grady* (1922); *Ariel, ou la vie de Shelley* (1923); *Bernar Quesnay* (novel, 1926); *Meipe, ou la délivrance* (1926); *Etudes Anglaises* (1927); *La Vie de Disraeli* (1927); *Les Dernières Jours de Pompei* (study of Bulwer Lytton and his wife, 1928); *Aspects de la biographie* (1928); *Byron* (1930); *Marshal Lyautey* (1931); *Voltaire* (1932); *Dickens* (1934); *Chateaubriand* (1938); *Tragedy in France* (1940); and *Seven Faces of Love* (1948). During the First World War he was attached to Brit. troops as liaison officer. His chief fame rests upon the biographies which are

so interesting as novels. His autobiographical *I Remember, I Remember* was pub. in 1942, and *Call No Man Happy* in 1943. See D. Saurat, *Modern French Literature*, 1946.

Maurolico, or Marullo, Francesco (1494-1575). It. mathematician, was of Gk. origin. He became a monk and taught mathematics at Messina. In that he used letters in arithmetical calculations, he may be said to have paved the way for algebra; in trigonometry he introduced secants; and in his *Treatise on Conics* he attempted to deduce the curves from the fact that they are arcs of circles in perspective. His *Cosmographia* appeared in 1543.

Maurras, Charles Marie Photius (b. 1863), Fr. royalist writer, b. at Martigues. He was literary critic for Larousse's encyclopaedia, 1894-1900. In 1908 he assisted Léon Daudet in turning *L'Action française* into a daily paper; it had a profound stimulating effect on Fascism in Italy. In Oct. 1926 he was imprisoned for accusing a minister of favouring Communism and for inciting to disturb the peace. In 1945 he was sentenced to solitary confinement for life as a collaborator during the Ger. occupation of France. His writings include *Jean Moreau* (1891); *Trois idées politiques* (1898); *Chateaubriand, Michelet, Sainte-Beuve* (1898); *Les Amants de Venise, George Sand et Musset* (1902); *L'Avenir de l'intelligence* (1905); *La Musique intérieure* (poems, 1925); *Au signe de Flore* (autobiography, 1933); *Dictionnaire Politique et critique* (1933-34); *Louis XIV, et la France* (1935); *Les Vêpres sur la mer* (1937); *Jeanne d'Arc* (1937); *Mes idées politiques* (1937); *Louis XIV, ou l'Homme-roi* (1939); *La Seule France. Chronique des jours d'épreuve* (1941); and *De la colère à la justice* (1942). His collected writings about the First World War were pub. as *Les Conditions de la victoire* (1915-20). See A. Thibaudet, *Les Idées de Maurras*, 1920; J. Maritain, *Une Opinion sur Charles Maurras et le devoir des catholiques*, 1926; study by L. Daudet, 1928; and J. P. Cotybie, *Charles Maurras, ou l'ennemi du peuple*.

Maury, Jean Siffrein (1746-1817), Fr. cardinal and orator, b. at Valréas, Vaucluse, was a cobbler's son. In 1771 he penned a much-admired *éloge* on Fénelon, and in the following year his *Panégyrique de Saint Louis* met with a most cordial reception. In 1785 he was elected to the Fr. Academy. During the sittings of the National Assembly, from 1789 to 1792, he defended the Church and the ancien régime with bravery and with a lively wit which succeeded in disarming his opponents. Pope Pius VI. welcomed him on his emigration (1792), and in 1794 he became cardinal. The acceptance on his part of the archbishopric of Paris from Napoleon (1810) was the cause of subsequent disgrace and imprisonment. His *Essai sur l'éloquence de la chaire* (1777) has become a classic. See life by G. Bonet, 1892.

Maury, Matthew Fontaine (1806-73), Amer. naval officer, astrophomer, and

hydrographer. In 1825 he was appointed midshipman in the U.S. Navy, and in 1836 he was made lieutenant, but being lame by an accident he was appointed to the Hydrographical Office at Washington. While there he wrote his *Physical Geography of the Seas* (1856) and his works on the ocean currents and great circle sailing. In 1855 he was made commander, and publ. sev. works. See life by his daughter, 1888.

Maurya, the name of a great dynasty which was supreme over N. India for 137 years. In 321 B.C. Chandragupta Ma. captured the throne of Magadha (or Behar), and estab. an empire stretching from the Arabian Sea to the bay of Bengal.

raised in 353 B.C. a splendid tomb, for centuries the glory of the Asiatic city of Halicarnassus. The remains of the colossal group, which once crowned the two colonnaded tiers, now rest in the Brit. Museum. The most ambitious mausolea are those of Augustus and Hadrian (the castle of San Angelo) at Rome; those of Frederick William III. and Queen Louisa at Charlottenburg near Berlin; of Napoleon III. at Farnborough; and that of Lenin at Moscow.

Mauve, Anton (1838-88), Dutch landscape painter, b. at Zaandam, was a friend of Israels and Maris, and uncle of Vincent van Gogh. His rural pictures breathe sombre peace and are attractive for the



LENIN'S MAUSOLEUM AT MO

Dr. D. J. Dillon

The greatest of the M. kings was Asoka (q.v.), the founder's grandson; the last was Brihadratha.

Mauser Rifle and Pistol. These were invented and constructed by Wilhelm M. (1834-82) and Paul M. (1838-1911). The rifle has great accuracy and durability: it has a bolt action and a charger-loaded magazine; the locking-lugs are at the forward end of the bolt, with which the bolt-head is integral. The pistol is an automatic, holding ten rounds in the grip; there are sev. calibres, the .30 mm. being sighted to 1000 yds.

The rifle, which has both military and sporting uses, was the standard Ger. Army weapon from 1872 to 1945, and is also used by many other armies, including the Sp., Brazilian, and Turkish. The pistol was replaced in the Ger. Army by the Luger during the Second World War. It is an officer's weapon in many forces, both in Europe and in S. America.

Mausoleum, essentially a large and imposing sepulchral monument. The word is derived from Mansolus, king of Caria, to whose memory Artemisia, his wife,

great delicacy of their tonal scheme. He was a pupil of Van Os, for whom, however, he did not greatly care as an artist, and one can see the influence of Millet in his works.

Mauve (Lat. *malva*, mallow) was first patented as a dye by Sir Wm. H. Perkin in 1858. It was the first of the aniline dyes to be practically used in the arts. It is produced by the oxidation of aniline by the use of sulphuric acid and potassium dichromate, the base of the colour being *Mauveine* ($C_6H_2N_4$).

Mavor, Osborne Henry, see BRIDIE, JAMES.

Mavors, see MARS.

Mavrogordato, Mavrocordato, or Mavrocordatos, name of a distinguished family of Phanariot Greeks.

Alexander Mavrogordato (c. 1636-1709), doctor of philosophy and medicine who was very influential at the court of Sultan Mustapha II. It was he who arranged the peace of Karlowitz (1699).

Nicholas Mavrogordato (1670-1730), Alexander's son. He was prince (hospodar) of Wallachia, and ruled the Danubian

principalities for the sultan, exciting the bitter indignation of the Romanians by his Hellenising efforts.

Prince Alexander Marogordato (1791-1865), descendant of Nicholas. He defended Missolonghi during the Gk. War of Independence (1822-23). In 1832 he was chosen vice-president of the Gk. national assembly at Argos, and the following year he became first minister to King Otto. He was Gk. ambas. at Berlin, London, and Constantinople, and on two later occasions (1844 and 1855) the vicissitudes of the political situation brought him to the head of affairs.

Mawson, Sir Douglas (b. 1882), Eng. explorer and geologist, b. in Bradford, Yorkshire, and educated at Sydney Univ. He went on a geological expedition to the New Hebrides, 1903, and was appointed to the scientific staff of Shackleton's expedition, 1907-8, which determined the position of the S. magnetic pole. He organised and commanded the Australian expedition, 1911-14, to explore the Antarctic lands S. of Australia, establishing a wireless telegraphic station on Macquarie Is. He discovered and explored King George V. Land, and his assistant, Dr. Wild, discovered and explored Queen Mary Land. A full account of this expedition is contained in M.'s work, *The Home of the Blizzard* (1915). In 1929-31 he visited the Crozets, Possession Is., and Heard Is. in the *Discovery* (Capt. Scott's old ship), and carried out oceanographical studies in the Australian sector of Antarctica, this time taking a small aeroplane with him. See C. E. Lasson, *South with Mawson*, 1948.

Max, Adolphe Eugène Jean (1860-1939), famous as burgomaster of Brussels, his bp. He was educated at the Athénées of Brussels and Ixelles, and at Brussels Univ., becoming doctor of law at twenty. He joined the staff of the newspaper, *La Liberté*, with Paul Hymans. Elected prov. councilor at twenty-five, he was communal councillor, 1903, and 'échevin,' 1908. On Dec. 7, 1909, he was appointed burgomaster. His actions on the approach of the Gers., Aug. 1914, were of the wisest and best calculated to spare the lives of the inhab. by giving no excuse for violence to the invaders, whom he met outside the city; and, when the occupation had begun he was indefatigable in his efforts to prevent oppression, refusing to be placed under a Ger. governor. He strove to keep up the courage of his compatriots by issuing posters contradicting the demoralising ones pub. by the Gers., and by protesting incessantly against the violation of the citizens' rights. The notorious von Bissing stopped the distribution of food rations in order to extort an additional tax of 30,000,000 fr., whereupon M. warned all banks that the city no longer guaranteed its bonds. This time he was arrested (Sept. 26), and imprisoned first at Namur, next at Glatz, next at Celle-Schloss, Hanover, where he was the object of unfounded accusations which occasioned his sojourn in military prisons, and finally at Goslar, just before the armistice. He escaped on Nov. 13, and

arrived on the 17th at Brussels, where he had a tremendous ovation. Made minister of state four days later, he was elected to the chamber, 1919. His honours included the G.C.V.O., 1920; G.C.B.E., 1921; honorary citizenship of Edinburgh, 1923.

Maxcanú, com. in the state of Yucatan, Mexico, 36 m. S.W. of Mérida. The grotto of M. is looked upon as sacred. Pop. 10,000.

Maxence, Saint, see MAIXENT.

Maxentius, Marcus Aurelius Valerius, Rom. emperor (A.D. 306-12); put his rival, Severus, to death, and banished his father, Maximianus (q.v.), to Gaul. Constantine, son-in-law of Maximianus, slew Maximianus in 310, and in 311, when Galerius died, Constantine and Licinius leagued themselves against M. and Maxentius. Constantine defeated the armies of M. in various battles, notably at Salsa Rubra, near Rome, and so won supremacy over the old cap. and Italy. M. was drowned in the Tiber (312) while trying to escape over the Mulvian bridge (now the Ponte Milvio). See H. von Schoenebeck, *Beiträge zur Religionspolitik des Maxentius und Constantin*, 1939.

Maxillaria, genus of terrestrial orchids with thick fleshy flowers, occurring mainly in central America.

Maxim, Hiram Percy (1869-1936), Amer. engineer, son of Sir Hiram Stevens M. He patented a number of inventions of electrical instruments and improvements in automobiles, his most noted invention being the M. silencer for firearms. See his *Life's Place in the Cosmos* (1933).

Maxim, Sir Hiram Stevens (1810-1916), Amer. civil, mechanical, and electrical engineer, b. at Saugerville, Maine, U.S.A. He first made experiments and improved steam engines, and invented an automatic gas engine. He then studied electricity, invented an incandescent electric lamp, and the method of using carbons in electric lighting. His great work, however, was the automatic system of firearms, and he was formerly connected with the firm of Vickers, Sons, & M. He became a naturalised Brit. subject, and was knighted in 1914. See his *My Life* (1915).

Maxim, Hudson (1853-1927), Amer. inventor of explosives; younger brother of Sir Hiram M. In 1890 he built a manufactory of dynamite and smokeless powder at M., New Jersey, a tn. named after him. He invented the high explosive called Maximite. During the First World War he was chairman of the ordnance and explosives committee of the naval consulting board. Pubs.: *The Science of Poetry and the Philosophy of Language* (1910); *Defenceless America* (1915); and *Dynamite Stories* (1916).

Maxima and Minima. Many mathematical problems are comprised under this head. For example, a line of given length may be made to enclose various shaped and sized figures; what is the greatest space it can be made to enclose? A number is the sum of two other numbers; of all the pairs that can be selected, which pair will show the greatest product? Many such problems were stated and solved by the anc. Gks. Euclid has many pro-

positions of this nature solved by geometrical methods. Such problems are of great practical value in the useful arts; *e.g.* given a certain amount of metal, what dimensions for a cylindrical cistern will provide the greatest capacity? Or again, given a log of wood, what dimensions on cutting to a rectangular beam will give the greatest strength? In each problem a maximum or minimum has to be found. The study of curves, the conditions of their formation by a moving point, has led to greater complications; there are three phases to be determined: rise, fall, and turning. A curve attains a maximum at the moment it ceases rising and commences to fall, a minimum at the moment it ceases to fall and commences to rise. Or, in algebraic language, when any value y of a function is greater than the immediately neighbouring values, both before and after, it is called a maximum value of the function; when any value y of a function is less than the immediately neighbouring values, both before and after, it is called minimum value of the function. There may be many maxima and many minima, and a maximum value according to the definition above is not necessarily the greatest value the function may have. Considering an irregular wavy curve, each \max and \min is the highest or lowest point occurring in any phase, and a minimum may have a higher value than a maximum. Bernoulli in 1696 propounded and solved problems by methods which became known as 'isoperimetrie.' This was extended by Euler, and led to the invention by Lagrange of the calculus of variations. Practically speaking, the subject is now investigated by the differential calculus. Curves are considered from the point of view of gradient; the gradient is represented by the symbol $\frac{dy}{dx}$, where y is a function of x .

and at the turning points $\frac{dy}{dx} = 0$. Further differentiation distinguishes between M. and M., *i.e.* for a maximum $\frac{d^2y}{dx^2}$ is positive, for a minimum negative. See any book on differential calculus.

Maximianus I. (M. Aurelius Valerius Maximianus), Rom. emperor (A.D. 286-305), originally a Pannonian soldier, was made by Diocletian his colleague in the empire, but was compelled to abdicate along with the latter. When his son, Maxentius, assumed the imperial title in the following year (306), he resided some time at Rome, but being expelled from the city by Maxentius, he took refuge in Gaul with Constantine, who had married his daughter, Fausta. It is generally supposed that he was compelled by Constantine to put an end to his own life at Marseilles in the year 310. See also MAXENTIUS.

Maximianus II. (Galerius Valerius Maximianus) (A.D. 305-11), Rom. emperor, the son of a shepherd. He served in the wars of Aurelian and Probus, and in 292 was made Caesar and entrusted with the command of Illyria and Thrace. Upon

the abdication of Diocletian and Maximianus I. in 305, he became Augustus, but in 307 suffered defeat at the hands of the usurper Maxentius, and lost Italy and Africa. The rest of his life was spent in works of public utility, but his reign is notorious for his pitiless persecution of the Christians.

Maximilian I. (1459-1519), one of the most distinguished of the Ger. emperors, the son and successor of Frederick III., was b. at Neustadt, near Vienna. In his nineteenth year he married Maria, the heiress of Charles the Bold, duke of Burgundy, and was soon involved in war with Louis XI. of France, who attempted to seize some of her possessions. M., although successful in the field, was compelled, by the intrigues of Louis in the Netherlands, to betroth his daughter Margaret, then four years old, to the Dauphin, afterwards Charles VIII., and to give Artois, Flanders, and the duchy of Burgundy as her dowry. In 1486 he was elected king of the Romans. Insurrections in the Netherlands, encouraged and supported by France, again involved him in war with Louis XI. He afterwards repelled the Hungarians and the Turks. He again took up arms against France when Charles VIII. repudiated Margaret and married Anne of Bretagne, in order to acquire that great prov. A peace was, however, soon concluded at Senlis in 1493. M. receiving back the provs. which he had given with his daughter. On the death of his father in 1493 he became emperor, and he subsequently married Bianca Sforza, daughter of the duke of Milan. He sought to put a stop to Fr. conquest in Italy, and was at first successful, but ultimately he had to give up Milan to France and Verona to the Venetians. Nor was M. more successful against the Swiss, who, in 1499, won their independence from the Ger. Empire. The marriage of his son Philip with the Infanta Juana, and of his daughter Margaret with the Infant Juan of Spain, led to the subsequent union of Spain with Austria, whilst the marriage of two of his grandchildren with the son and daughter of Ladislaus, king of Hungary and Bohemia, brought both these kingdoms to the Austrian monarchy.

M. carried out some military reforms, estab. the Reichskammergericht or imperial court of justice, and set up an aulic council. Versatile and cultured, he was a patron of learning; he himself wrote works on law and hunting. See life by L. R. Seton-Watson, 1902; and J. Grünbeck, *Die Geschichte Friedrichs III. und Marienmilans*, 1940.

Maximilian II. (Joseph) (1811-64), king of Bavaria, son of Louis I., b. at Munich, married in 1842 the Princess Maria Hedwig. Until 1848 he took no part in political affairs, but in that year of revolution he was suddenly called to the throne on his father's abdication. He adopted a liberal policy.

Maximilian, Ferdinand Joseph, Archduke (1832-67), son of Archduke Francis Charles of Austria and son-in-law of Leopold I., king of the Belgians, whose

daughter Charlotte he married in 1857. He was b. at Schönbrunn, Vienna, and was made governor of Lombardo-Venetia in 1857 by his brother, Emperor Francis Joseph, in pursuance of his policy to conciliate the It. republics, but M.'s chivalrous nature availed nothing against the implacable hatred of Italy for Austria. Fr. troops invaded Mexico and on the capture of Puebla in 1863, with the co-operation of the Mexican clerical party, proclaimed M. emperor of Mexico. Renouncing his Austrian rights, M. accepted the throne. Civil war followed, and in 1866 the Fr. troops were withdrawn. M. was captured and shot at Querétaro, probably by order of Juárez. See E. Corti, *Die Tragödie eines Kaisers*, 1933, and M. Hyde, *Mexican Empire*, 1945.

Maximinus, Caius Julius Verus (Maximinus Thrax), Rom. emperor (A.D. 235-238). was originally a Thracian shepherd. He was of gigantic size and great bodily strength. Alexander Severus gave him



A BRONZE BUST OF MAXIMINUS THRAX

the command of a new legion raised in Pannonia, at the head of which he followed Alexander in his campaign against the Gers. on the banks of the Rhine, where he induced some of his companions to murder Alexander and his mother, Mamaea (A.D. 235). He was proclaimed emperor, but his cruelty and rapacity aroused enemies against him in various parts of the empire. He was killed by his own soldiers in A.D. 238 when he was besieging Aquileia.

Maximinus, Galerius Valerius, Rom. emperor (A.D. 308-14), originally bore the name of Dacia, and in early life was a shepherd. Becoming a soldier, he was raised to the rank of Caesar, and made governor of Syria and Egypt in 305. In 308 he assumed the title of Augustus, and on the death of his uncle, Galerius, in 311, suc-

ceeded to the command of the provs. of Asia, and entered into a secret alliance with Maxentius. Having invaded Thrace in 313 in the absence of Licinius, he suffered a crushing defeat near Heraclea, and was forced to flee. His death took place at Tarsus.

Maximinus of Trèves (d. c. 349), Fr. bishop, b. near Poitiers. He became bishop of Trèves in 332, and became a staunch defender of St. Athanasius and St. Paul when they were exiled by the Arian emperor. At the councils of Milan, Sardica, and Cologne he was a foremost opponent of Arianism.

Maximus, Magnus Clemens, Rom. emperor (A.D. 383-88), a native of Spain. He accompanied Theodosius on several of his expeditions, and remained for some years as a general in Britain. Hero he was elected emperor by the troops in 383, and immediately crossed to Gaul to attack Gratian. The latter was defeated and slain, and Gaul, Spain, and Britain did homage to M. In 387 he crossed the Alps, put Valentinian to flight, and estab. himself in Milan, but was defeated by Theodosius at Sixia, on the Saône, and again at Poetovio on the Danube, being subsequently captured and put to death at Aquileia.

Maximus, Petronius Anicius, Rom. emperor (A.D. 455), was a member of the high nobility of Rome. At the age of nineteen he was admitted to the council of the Emperor Honorius, and in 420 held the office of prefectus Romæ, becoming consul in 433, and again in 443. He was friendly with Valentinian III. until the emperor seduced his (M.'s) wife, after which M. murdered him in 455. M. was elected emperor immediately, and married the widowed Empress Eudoxia. She, on learning the truth of her former husband's death, secured the help of Genseric the Vandal, who sacked Rome. M. was slain.

Maximus, Rutilius, Rom. jurist, who wrote a treatise entitled *Ad Legem Fa-
cidianum*, which was enacted 40 B.C.

Maximus, Tyrius (of Tyre), rhetorician and Platonic philosopher, lived in the latter half of the second century, during the reigns of the Antonines and of Commodus. There are extant forty-one dissertations of M. T. on various points connected with the Platonic philosophy, which are written in an easy and pleasing style, and more commendable for the expression than the matter. The following examples will give some idea of the subject of these dissertations: 'On Plato's Opinion respecting the Deity,' 'Whether we ought to return Injuries done to us,' 'Whether Prayers should be addressed to the Deity,' etc. The dissertations have been trans. into Fr. by Forey (1764) and by Dounais (1802, new ed. 1910). See K. Meiser, *Studien zu Maximus Tyrius*, 1909.

Max-Müller, Friedrich, see MÜLLER.

Maxton, James (1885-1946), Scottish politician, b. in Glasgow, educated at Grahamston School, Barhead, Hutchinson's Grammar School, Glasgow, and Glasgow Univ. As an undergraduate he belonged to the Conservative Club, but

after having become a school teacher he embraced Socialism with all the ardour of a convert, and spent much of his spare time in speaking for the Independent Labour party, of which he was elected chairman of the Scottish divisional council. In 1914 he was appointed to the national administrative council as representative for Scotland, and during the First World War was a pacifist and conscientious objector. In 1916 he was sentenced to twelve months' imprisonment for inciting munition workers to mutiny, in a public speech. In 1926 he became chairman of the I.L.P. For twenty-four years he was M.P. for Bridgeton, Glasgow. An uncompromising revolutionary and advocate of 'direct action' he was none the less a man of great humanity, respected by all parties, and one of the most popular members of the House of Commons. M. led the so-called 'ginger group' in the Labour party—Clydeside M.P.s anxious to 'ginger up' the Labour movement in the years following the First World War. In 1929 he left the Labour party after the secession of the I.L.P. Although M. and his friends were largely responsible for placing Ramsay MacDonald at the head of the Labour party, he was not asked to take office in either Labour administration (1924, 1928). He pub. a study of Lenin, and made contributions to the 'If I were Dictator' series.

Maxwell, Sir Herbert Eustace, seventh Baronet (1845–1937), writer and politician, b. in Edinburgh, fourth son of the sixth baronet of Monreith, was educated at Eton and Christ Church, Oxford. M.P. for Wigtownshire, 1880–1906, he was third lecturer in archaeology at Edinburgh, 1893–1911; lecturer on Scottish hist. in Glasgow Univ., 1910, and president of the Society of Antiquaries of Scotland, 1900–13. In 1925 he was appointed as first president of the governing board of the Scottish National Library. He took a special interest in social legislation, and was chairman of select committees on provident insurance and friendly societies. He was a lord of the treasury (Junior whip), 1886–92, and sworn of the Privy Council in 1897. Although he will be best remembered as a writer, he was over forty when he pub. his first book. Among his works are *Studies in the Topography of Galloway* (1887); *The Art of Lore* (a novel, 1889); *The Letter of the Law* (a novel, 1890); *Life of the Duke of Wellington* (1900); *The Chevalier of the Splendid Crest* (1900); *The House of Douglas* (1901); an ed. of the *Crewey Papers* (1903); *British Freshwater Fishes* (1904); *Scottish Gardens* (1908); *A Century of Empire* (vol. i., 1909; vol. ii., 1910; vol. iii., 1911); *The Making of Scotland* (1911); *Early Chronicles relating to Scotland* (1912); *Edinburgh, a Historical Study* (1918); *Flowers, a Garden Notebook* (1923); and *Inter Alia* (1925).

Maxwell, James Clerk (1831–79), Scottish physicist, b. at Edinburgh; educated at the Edinburgh Academy and the univs. of Edinburgh and Cambridge. At the early age of fifteen he sent to the Royal Society of Edinburgh a paper on the 'Description of Oval Curves,' and during the

next three years followed it up by 'On the Theory of Rolling Curves' and 'On the Equilibrium of Elastic Solids.' In 1856 he became prof. of natural philosophy at Marischal College, Aberdeen, and in 1860 held the same post in King's College, London. He was a member of the Royal Societies of London and Edinburgh. On the endowment by the duke of Devonshire of Cambridge Univ. with a model laboratory of experimental physics (the Cavendish Laboratory), M. was elected unanimously as the first prof. of experimental physics in that univ. M.'s final presentation of his theory was given in the treatise on electricity and magnetism in 1873. The theory at first had few adherents, one reason being that M.'s presentation of his theory was in some features exceedingly obscure. The two definite statements about electricity made by M. were: that wherever there is electric force there is displacement, and that electricity behaves like an incompressible fluid. M.'s electro-magnetic theory was that waves of light were waves of electric and magnetic force. It was not until ten years after M.'s death that any direct experimental evidence of the existence of electrical waves was obtained. He also investigated the molecular constitution of matter, the kinetic theory of gases, and geometrical optics, and wrote, *inter alia*, treatises on the dynamical theory of gases (1859), heat (1871), and matter and motion (1873). See lives by L. Campbell and W. Garnett, 1882; R. T. Glazebrook, 1896; Sir J. J. Thomson, 1931; and R. L. Smith-Rose, 1948.

Maxwell, Mrs. John, see BRADDON, MARY ELIZABETH.

Maxwell, Sir John, see HERRIES.

Maxwell, Robert, Lord (d. 1546), member of a Scottish family which settled near Kelso about 1100. He was a member of the royal council under James V., a warden of the W. marches, and a lord provost of Edinburgh. He was also an extraordinary lord of session in 1533, and one of the regents in 1536. He was taken prisoner by the Eng. at the rout of Solway Moss in 1542.

Maxwell, Lady Stirling, see NORTON CAROLINE ELIZABETH SARAH.

Maxwell, William Babington (1866–1938), Eng. author, son of John M., publisher, and his wife, Miss Braddon, authoress of *Lady Audley's Secret*. After a brief spell as an art student he turned to fiction. He pub. *The Countess of Maybury* in 1900, and produced a novel each year thereafter till 1913. Among his novels during this and his later period of activity were *The Guarded Flame* (1906); *The Devil's Garden* (outspoken on moral subjects, 1913); *The Mirror and the Lamp* (1918); *Tudor Green* (1935); *The Emotional Journey* (1936); and *Everslade* (1937) – the last three being a trilogy which appeared under the general title *Men and Women*. His autobiography, *Time Gathered*, appeared in 1938.

Maxwelltown, tn. in Kirkcudbrightshire, Scotland, on the Nith, opposite Dumfries, with which it is connected by bridges. It has dye-works, sawmills, and nurseries,

and manufs. tweed, woollens, gloves, and hosiery. An observatory, with a museum, is situated on Corbally Hill, quite near to M. Pop. 6000.

May, Philip William (1864–1903), Eng. humorous artist, b. in Leeds, and known as Phil May; after an adventurous career as a lad he achieved popularity with his illustrations to *The Parson and the Painter* (1891). He pub. *Annuals* from 1892, and contributed sketches of low life to numerous papers. In 1896 he became a member of the staff of *Punch*. He was one of the greatest black-and-white artists, and a lineal descendant of Leech and Keene. See life by J. Thorpe, 1932.

May, Thomas (1595–1650), Eng. writer, b. in Sussex; graduated at Sidney Sussex College, Cambridge. He was admitted to Gray's Inn in 1615, but being prevented by defective utterance from practising the law, devoted himself to literature. He first produced a comedy entitled *The Heire* (1622), which was much praised by Thomas Carew, and followed this by another comedy and three classical tragedies, but none of these met with success. In 1627 appeared his trans. of Lucan's *Pharsalia*, which met with unstinted praise from Ben Jonson, and gained him the favour of Charles I. In 1628 he pub. a version of Virgil's *Georgics*, and the following year Martial's *Epigrams*. In 1633 he was commissioned by the king to write two narrative poems, one on *Henry II.*, the other on *Edward III.* His reputation as a prose writer rests upon his *History of the Long Parliament* (1647), which is described by Chatham as being 'a much honester and more instructive book than Clarendon's.' See A. G. Chester, *Thomas May*, 1932.

May, Sir Thomas Erskine, first Baron Farnborough (1815–86), Eng. constitutional jurist, b. in London. He was assistant librarian of the House of Commons in 1831, and a barrister at the Middle Temple in 1838. In 1844 he pub. *A Treatise on the Law, Privileges, Proceedings and Usage of Parliament* (10th ed., much enlarged, 1893; ed. by Sir T. L. Webster, 1921), a learned work which has been trans. into Ger., Fr., It., Sp., Jap., and Hungarian. He was examiner for private Bills and taxing-master for both Houses of Parliament, 1847–56, and clerk of the House of Commons, 1871–86. He was president of the Statute Law Revision Committee, 1866–84, a member of the Privy Council, 1881, and created Baron Farnborough in 1886. Besides the work mentioned above he pub. *The Constitutional History of England since the Accession of George III., 1760–1860* (1861–63) and *Democracy in Europe: a History* (1877).

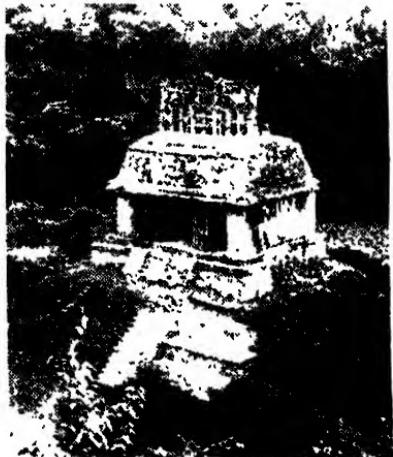
May, fifth month of the year, and the last of spring. It was the third month in the Rom. calendar, and was called M. probably after Maia, the mother of Mercury, to whom the Romans used to sacrifice on the first day of this month. It was regarded by the Romans as an unlucky month, especially for marriages, and the superstition still survives in some parts.

Maya, or Mahamaya, mother of Gautama

Buddha. According to tradition she and her sister, Prajapati, were the prin. wives of Kshattriya, a wealthy landowner of a small state surrounding Kapilavastu, in S. Nepal. At the age of forty-five M. bore Gautama, c. 560 B.C., in a wayside grove, which was visited three centuries later by Asoka, whose commemorative pillar there was discovered in 1895.

Maya, race of Amer. Indians, the aborigines of Yucatan. The old Mayan empire fl. between the second and seventh centuries A.D. In A.D. 1000 a new empire was estab. which survived until the coming of the Spaniards in the early part of the sixteenth century. There was an organisation of city states, though without one single ruler. They were the most advanced of the Amer.-Indian races, had a written language, and have left numerous examples of MSS. and picture-writing. In religion they had much in common with the Aztecs; they were polytheistic, and worshipped a sky god, who was the creator, and gods of the moon, rain, death, etc. In their sculptures the two most frequently depicted are the rain god and the god of arts and crafts. Religious festivals were frequent: gifts of crops and animal sacrifices were made, and human sacrifices, though at first rare, became common later. The Mayans subsisted chiefly on agriculture, the prin. food being maize. They made many ornaments of gold, greenstone, jade, and copper, but they were especially skilful in architecture and in carving in stone. They erected buildings of vast size, which they decorated in a wonderful manner, and though these cannot compare with the buildings of Egypt and Greece, their massive character and lavish wealth of carvings attest a civilisation far superior to that of many civilised peoples in the old world. One of the most famous Mayan works of art is in the temple of Palenque, which contains a remarkable tablet, on which is represented a sacrificial scene. Expeditions under the aegis of the Brit. Museum have explored Brit. Honduras for Mayan remains. A site at Pusila disclosed, on excavation, a stone stela containing one of the longest and most important of known Mayan inscriptions. A form of picture-writing was used, and an arithmetical system of counting in twenties, which made possible considerable progress in mathematical and astronomical science. On the S. Stann Creek site two large plazas were found, surrounded by mounds and pyramids, which are supposed to have been the substructures of temples or altars. Numerous examples of Mayan pottery have also been found; also spear-heads, incense-burners, jadeite ear ornaments, and greenish stone axes. The Ms. of to-day, in Yucatan, have small, sturdy, agile figures, and the strange curve of the nostril and the nose, and the mouth with straight upper lip that are found represented in the early Mayan paintings. The women wear the traditional smock, called the *upil*, with embroidered flowers round hem and shoulders, and a white underskirt showing below. The love of the Ms. for pageantry, which is evident in the

old friezes, is maintained in the Christian tableaux in the churches, and in the wealth of decoration adopted from Spain. Round the churches the Mayan houses are still built like the models carved on the temple walls of Uxmal, being oval in shape and very primitive. So little have the people changed that their anc. feud against the Aztecs is not forgotten, and even to-day the Yucatani hates to be called Mexican. The Mayan language is still spoken, but it has ceased to be written (Freya Stark). See T. W. Gunn, *The Mayan Indians*, 1918; A. Joyce, *Maya and Mexican Art*, 1927; J. L. Mitchell, *The Conquest of the Maya*, 1934 (elaborates some original



Mexican Embassy

THE MAYAN TEMPLE OF PALENQUE

theories on the nature of Mayan culture); S. C. Morley, *The Ancient Maya*, 1946; and V. W. von Hagen, *Maya Explorer: John Lloyd Stephens and the Lost Cities of Central America and Yucatan*, 1947.

Maya, or Maia, riv. in E. Siberia, is a trib. of the Aldan, joining it on the r. b. after a course of 600 m.

Maya, illusion (otherwise called *Aridya*, ignorance, or *Sakti*, power), in Vedanta philosophy is the fictitious energy which in conjunction with the Highest Self (Atman, Purusha) produces or constitutes the Isvara, the Lord, or cosmic soul, the first emanation of the Atman, and himself the fictitious cause of all that seems to exist.

Mayaguez, tn. on the coast of the is. of Porto Rico, 70 m. W.S.W. of San Juan. The chief exports are sugar, coffee, hides, and fruit, mainly oranges. In 1918 M. suffered considerably from an earthquake. Pop. 76,500.

May-Apple, see *PONOPHYLLUM*.

Maya-Quiché, collective name for all the pops. among the Amer. Indians who speak various forms of a common language, is

derived from the two most important members of the group, the Mayas of the Yucatan plains and the Quichés of the Guatemalan plateaux. They inhabited Mexico, Yucatan, Guatemala, and Honduras, and represented the most cultured inhab. of central America at the time of the Sp. conquest. Among the various nations may be mentioned the Mayas, Chols, Zendals, Mamés, Lacandons, Pocomans, Cachiquels, Quichés, Huaxtecs, Itzas, Poconchis, and Zotzils.

Mayavaram, tn. in the Tanjore dist., Madras India, 174 m. S.W. of Madras. It manus. cotton and silk goods. Pop. 50,000.

Maybole, police burgh and mrkt. tn. in Ayrshire, Scotland, 8 m. S. of Ayr, possesses an old castle. The chief industry is the manuf. of shoes. Pop. 4,900.

May Day, May 1st, was formerly celebrated throughout Great Britain, and to a lesser extent in France and Germany, with festivities, which now survive only in a few rural dists. They are the direct descendants of the anc. Rom. Floralia, and of the Druidic feasts in honour of the god Bel. In Tudor England the custom seems to have been for people to go into the woods in the night, gather branches of trees and flowers, and return with them at sunrise to decorate their houses. Then there was the crowning of the M. queen, who held sway for one day over her court, consisting of morris dancers, Robin Hood, Maid Marian, Friar Tuck, Little John, and other members of the same band, as well as of the villagers and townspeople. And all who wished danced round a maypole decorated with flowers and ribbons. The maypole was generally made of birch, and was set up on April 30, except in London, where permanent maypoles stood in the streets. The M. revels were much censured by the Puritans, and in 1644 maypoles were forbidden to be erected by the Roundhead Parliament. They were, however, sanctioned at the Restoration, and in 1661 a cedar pole, 134 ft. high, was erected in the Strand. It was taken down about 1717, and used by Sir Isaac Newton as a support for the great telescope which had been presented to the Royal Society by a Fr. astronomer. The date is now observed as Labour Day (q.v.).

Mayebashi, tn. of Honshū, Japan, 70 m. N.N.W. of Tokio. It trades chiefly in silk. Pop. 80,000.

Mayen, tn. in the Rhineland-Palatinate, Germany, 15 m. W. of Koblenz. It has cloth factories, breweries, and tanneries. Basaltic lava, used for paving stones, is quarried in the vicinity. The tn., originally a Rom. settlement, gained new importance in the Middle Ages, and by the thirteenth century possessed a tu. wall and a castle, some relics of both still remaining. Pop. 15,000.

Mayence, see MAINZ.

Mayenne: 1. Dept. of W. France, formed from parts of the old prov. of Maine and Anjou. M., which is included almost entirely within the basin of the Loire, has a mild climate, but only a partially productive soil, being occupied in many dists. by extensive sandy heaths. The chief

Mayer

branches of industry are the breeding of cattle and sheep and the keeping of bees, while iron mines and marble and slate quarries are worked. The linen, hemp, and paper manufs. and cider making are of some importance. Cap., Laval. Area 1936 sq. m. Pop. 256,300. 2. Tn. of the above dept. on the Loire, on the r. b. of which rises, on a steep and rocky height, the anct. fortress of the dukes of M. There are linen and calico manufs. Pop. 8200. 3. Riv. in the N.W. of France, which rises in the dept. of Orne, and debouches at Pont-de-Cé into the Loire. Length 130 m.

Mayer, Johann Tobias (1723-62), Ger. astronomer, was b. at Marbach. He taught mathematics for a living and studied gunnery in his spare time. He pub. a memoir in 1730, *On the Libration of the Moon*. In 1751 he became director of the observatory at Göttingen, and afterwards prof. of economy in that univ. His *Zodiak Catalogue* was his next work, and in 1755 he pub. his *Lunar Tables*. These tables were printed by the Board of Longitude in the year 1767, and likewise the *Solar Tables*, by the same author, in the year 1770. To M. is also due the discovery of the principle of the repeating circle, which was afterwards so fully developed by Borda, and employed by him in the measurement of the arc of the meridian.

Mayer, Julius Robert von (1811-78), Ger. physicist, b. at Heilbronn. He studied at Tübingen, Munich, and Paris, and subsequently settled as a physician in his native tn. In 1812 he pub. *Bemerkungen über die Kräfte der unbleiblen Natur* as a preliminary to *Die organische Bewegung in ihrem Zusammenhang mit dem Stoffwechsel*, which appeared three years later. Both of these deal with the conservation and transformation of energy. See E. Dühring, *Robert von Mayer, der Galilei des neunzehnten Jahrhunderts*, 1895, and H. E. Timmerding, *Robert von Mayer und die Entdeckung des Energiesatzes*, 1925.

Mayfair, fashionable quarter of the W. of London, situated N. of Piccadilly and the Green Park. In the early eighteenth century originated a fair held, in May, in the Brook Field, near Chesterfield House, and M. takes its name from this. The Rev. Alexander Keith, who ministered in the dist. in the eighteenth century, is reputed to have solemnised about 7000 clandestine marriages.

Mayfield: 1. Vil. of Sussex, England, 11 m. from Tunbridge Wells, on the S. region railway. It was a mkt. tn. in the Middle Ages. There are slight remains of a palace belonging to the archbishops of Canterbury. 2. Tn. of Kentucky, U.S.A., co. seat of Graves co., 24 m. S. of Paducah. It has woollen and flour mills, cigar factories, and machine shops. Tobacco is the most important crop. Pop. 8600.

'Mayflower,' see under PILGRIM FATHERS.

Mayfly, see EPHEMERA.

Mayhem, see MAIM.

Mayhew, Henry (1812-87), Eng. author, b. in London. His first production was

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Mayo

the weekly periodical, *Figaro in London*, which he pub. with Gilbert & Beckett in 1831, and followed this by *The Thief* (the first of the 'bits' type of papers) in 1832. His prin. book, *London Labour and the London Poor*, appeared in 1831 (ed. by P. Quennell, 1949). His farce, *The Wandering Minstrel*, was produced in 1841. He collaborated with his brother Augustus in *The Good Genius* (1847); *The Plague of Life* (1847); and *The Image of his Father* (1851). He wrote also humorous stories and books on travel, and was one of the founders of *Punch*, of which he was co-editor with Mark Lemon.

May, Isle of, in the firth of Forth, Fifeshire, Scotland, 5½ m. S.E. of Crail. On the highest point of the is. is a lighthouse, and there are ruins of a twelfth-century priory.

Maymyo, hill station of Burma, 30 m. N.E. of Mandalay. It figured prominently in the Burmese campaigns of the Second World War. See further under BURMA, SECOND WORLD WAR, CAMPAIGNS IN, Fall of Fort Dufferin. Pop. 8000.

Maynard, tn. in Middlesex co., Massachusetts, 20 m. N.W. of Boston, on Assabet R. It has woollen manufs., cellulose products, plants, and powder mills. Pop. 6800.

Mayne, Jasper (1604-72), Eng. churchman, archdeacon of Chichester and a dramatist, baptised at Hatherleigh in Devonshire, where his family owned a small property, was educated at Westminster and at Christ Church, Oxford. He was rector of Cassington in 1639, and during the Civil war often preached before the king. At the Restoration he was made a canon of Christ Church, archdeacon of Chichester, and chaplain-in-ordinary to the king. He wrote *The City Match*, a domestic comedy (1659); *The Amorous War*, a trag-comedy (pub. 1648); and a trans. of Lucian's *Dialogues*, begun in 1638.

Mayne Reid, Thomas, see REID, MAYNE.

Maynooth, tn. of co. Kildare, Eire, 15 m. W. of Dublin. Its chief interest is its Rom. Catholic college, which was estab. during the ministry of Pitt in the year 1795, by an Act of the Irish Parliament. In the year 1846 Sir Robert Peel carried a Bill for an increased and permanent endowment, no longer dependent on a vote of Parliament. An endowment of £369,000 from public funds was granted in 1871. The college is a very striking Gothic structure, and receives students destined for the priesthood and resident within the building. A new chapel was erected in 1890. Pop. 900.

Mayo, Charles Horace (1865-1939), Amer. surgeon, b. at Rochester, Minnesota. As surgeon at St. Mary's Hospital, Rochester, he had much success in operations for goitre. He pub. works on goitre and cancer. He and his brother Wm. were chief consultants for all medical services in the First World War, and in 1915 gave \$1,500,000 to establish the M. Foundation for Medical Education and Research. He was awarded the gold medal of the National Institute of Social Sciences in 1918.

Mayo, Richard Southwell Bourke, sixth Earl of, *see BOURKE*.

Mayo, William James (1861-1939), Amer. surgeon, b. at Le Sueur, Minnesota, elder brother of Charles Horace M. He organised a small hospital which became St. Mary's, famous throughout the world as the seat of the Mayo Clinic.

Mayo, maritime co. of the prov. of Connaught, Eire, is bounded N. and W. by the Atlantic Ocean. The coast-line of M. is about 250 m. and is much indented by bays, the chief of which are Killala Bay, Clew Bay, Westport Bay, Newport Bay, Achill Sound, and Blacksod Bay. The surface is very irregular, the interior being part of the great plain of Ireland, bordered by two ranges of mts., separated from each other at the sea by Clew Bay. Of these ranges the highest points are Mulrrea (2680 ft.), Nephin (2530 ft.), and Croagh Patrick (2370 ft.). The soil of the central plain is fertile. The rearing of cattle is general, but tillage has increased of late years. Ironstone abounds in some dists., but is not worked. An excellent marble is found in the N.W. dist. The chief tns. are Castlebar, Westport, Ballina, and Ballinrobe, and the prin. rvs. are the Moy and the Owendore. Loughs Cullyn, Conn, Castleba, Corravore, and Carragh lie within the co. A valuable salmon-fishery exists in the R. Moy, and the small lake of Lough Mask is the habitation of the well-known 'gillaroo' trout. The antiquities of M. are chiefly eccles. Four round towers are still in existence, and there are at Cong the remains of a splendid abbey, which dates from the twelfth century. The celebrated 'Cross of Cong,' now in the museum of the Royal Irish Academy, was the archiepiscopal crozier of Tuam, once preserved in the abbey of that name. Area 2156 sq. m. Pop. 148,200.

Mayon, volcano in the prov. of Albay, Luzon Is., Philippine Isles. Its cone, which is perfect, rises to a height of 8274 ft., and the mt. is frequently in eruption.

Mayor. A M. was originally an overseer, or steward, or kind of bailiff, if the derivation from Norman *mair*, *mair*, be correct, and the word is really cognate with Armoric *mear*, i.e. one that looks after, tends, or guards, e.g. *mear y bisual*, a land steward. Others, however, derive the word from Lat. *major* greater, superior; plural, ancestors, a derivation which at once invites the assumption that it always, or very early, had its present connotation of chief magistrate (*magister* through *magnus*), whereas in Eng. hist. the mayoralty is a comparatively late development of the bor. organisation. Everywhere the M., whatever his particular functions, appears to have risen to eminence, but none to so great a degree as the 'M. of the palace,' or first officer of the royal household of the Merovingian kings. Holders of this office were successively chief officer of state, minister of the palace, and king, for the last of them, Pepin, after deposing Chilperic IV., founded the Carlovingian dynasty (A.D. 750). The M. at the present day as the head of a municipal corporation is in a prominent and responsible position

(for term of office, qualifications, etc., *see under BOROUGH*; COUNTY SESSIONS; MUNICIPALITIES.) In times of riot or civil disorders he has power, and indeed is compelled, to call in the aid of troops, a power the exercise of which in certain circumstances may place him in a very untenable position (*see Regina v. Pinney, 1866*), for technically at least he may be liable to criminal proceedings if he acts without justification and to an information for neglect if he omits to act. In other words, he must 'hit the precise line of his duty.' *See also*, for Lord Mayor, MAYOR'S COURT; LONDON, Government; PROVOST.

Mayor's Court, anct. court of record, held before the mayor and aldermen of the city of London at the Guildhall. Some authorities trace its origin to the anct. customary jurisdiction of the portreeve of London in the old hustings court of A.D. 675, from which the predecessor of the present M. C. became a distinct and separate tribunal in the reign of Henry III. The lord mayor and all the aldermen are the judges, but the recorder by custom sits as the sole judge, or, in his absence, the common serjeant, who in his turn, if unavoidably absent, may be represented by a barrister of seven years' standing. There is much of antiquarian interest in the M. C., both as to the names of its officials, e.g. the duties of a sheriff are carried out by the serjeant-at-mace and the deputy serjeant-at-mace, and as to the formalities of pleading. *See L. E. Glyn and F. G. Jackson, Jurisdiction and Practice of the Mayor's Court, 1910.*

Mayotte, *see COCHIN ISLANDS*.

Mayow, John (1610-79), Eng. chemist and physiologist, was b. in London, educated at Wadham College, Oxford, and practised as a physician in Bath. He pub. *Tractatus quinque medicophysici* (1671), containing 'De sal-nitro et spiritu nitro-areo,' which develops a theory of combustion, and important modern discoveries in pneumatic chem. *See C. G. Jocher, Gelehrten-Lexicon, III., 1751; J. F. Blumenbach, Institutiones Physiologicae, 1786; and J. C. Hoefer, Histoire de la Chimie, ii., 1842-43, 1866-69.*

Maypole, *see MAY DAY*.

Mayreau Island, *see under ST. VINCENT*.
Maysville, co. seat of Mason co., Kentucky, U.S.A., on the Ohio R., 60 m. S.E. of Cincinnati. The chief manufs. are cotton, flour, tobacco, and shoes. Pop. 6500.

Mayu: 1. Riv. of Burma, rises in the Chittagong hills, and after some 80 m. flows into the bay of Bengal N. of Akyab. 2. Hills of Burma near the Arakan coast. In 1942-44 they were the scene of fighting between Jap. and Brit. forces, since the road from Rangoon to Maungdaw passes through them, in a series of tunnels.

Mayurbhanj, Indian state with Orissa to the S.W., Bihar to the N., and W., and Bengal to the E. The highest point of its hilly area is Meghasani, at 3824 ft. The sole important tn. is Baripada. M. has vital artistic traditions, springing as it does from an anct. Bhanja kingdom. Area 4243 sq. m. Pop. 991,000.

Mayweed (*Matricaria inodora*), annual or

biennial plant of the order Composita. It has a branching growth, with narrow finely divided leaves and daisy-like scentless flowers with yellow centres. The stinking M. (*Athemis cotula*) has a malodorous juice which causes skin irritation when handled.

Maywood, tn. in Cook co., Illinois, U.S.A., 10 m. N. of Chicago, on the Desplaines R. It has large tin-plate works. Pop. 26,600.

Mazagan, seaport tn. of Morocco, 115 m. N. of Morocco. It is the port of Morocco, and its roadstead affords facilities for a safe anchorage. The chief exports are grain, almonds, hides, and wool. Pop. 40,300 (Europeans 2600).

Mazamet, tn. in the dept. of Tarn, France, 50 m. S.E. of Toulouse. Its chief manuf. are cloth, leather, and flannel. Pop. 15,000.

Mazanderan, prov. in the N. of Persia, lying between the Elburz Mts. and the Caspian Sea. It consists of a low coastal plain rising very rapidly to lofty mts. The rvs. are all short and very swift. The climate is unhealthy and malarious in the lowlands, where the ground is somewhat swampy, but fertile. Among the chief products is wool. Silk textiles are manufactured at Chalons. Other productions are rice, cotton, sugar, and other agric. crops. The chief minerals are iron and petroleum. Barfurush (now Babul) (pop. 30,000) is the largest tn., but Sari. 20 m. to the E., is the cap. Area 10,640 sq. m. Pop. 200,000.

Mazapil, tn. in Zacatecas state, Mexico, 65 m. S.S.W. of Saltillo. Pop. 6000.

Mazarin, Jules (properly *Giulio Mazarini*) (1602-61), cardinal and statesman, son of Pietro Mazarini, was b. at Piscina in the Abruzzi. His father was the intendant of the household of Philip Colonna, and his mother Ortenzia Buffalini was a connection of the Coloninas. Having received his elementary education at Rome from the Jesuits he passed into Spain with the Abbé (afterwards Cardinal) Girolamo Colonna, at the age of seventeen, where he attended courses of law in the univs. of Alcalá and Salamanca. But he soon abandoned jurisprudence for the military profession. From this time he began to display his talents for diplomacy. The generals of the pontif. Conti and de Bagni, sent him successively to the Duca de Feria, general of the Spaniards, and to the Marqués de Coeuvres, afterwards Marshal d'Estrées, who commanded the Fr. troops. He then resumed the study of jurisprudence and took his doctor's degree. But the disputed succession to the duchies of Mantua and Montferrat having kindled a new war, he quitted law finally for diplomacy. The competitors were the Duc de Nevers, whose cause was espoused by the court of France, at which he resided, and the Duca de Guastalla, who was supported by the emperor, the king of Spain, and the duke of Savoy. The pope, wishing to prevent a war of which Italy was about to become the theatre, sent Cardinal Sacchetti to Turin to act in favour of the Duc de Nevers, and M. accompanied him in this mission. Sacchetti returned to Rome

unsuccessful, leaving to M. the title of internuncio with power to continue the negotiations and to effect a peace. Cardinal Richelieu entertained the highest opinion of him, and feeling that France wanted an able man in Italy, he succeeded in winning over the young diplomatist, who from this time openly showed himself favourable to the interests of France, and went to Paris at Richelieu's invitation, through whose influence he was made a cardinal (1641). On the death of his patron he succeeded to his position and influence with Louis XIII., who shortly before his death nominated M. to the council of regency, presided over by the queen-mother, Anne of Austria. After some time she made him Prime Minister and invested him with absolute authority. The first years of his ministry were signalised by the victories of the Fr. over the Spaniards at Rocroy and Sens, which produced the peace of Westphalia, and by the commencement of the civil war of the Fronde. M. was twice compelled to yield to the storm raised against him and to quit France, but at length, as much by address as by force, he secured victory in the struggle. In 1659 M. concluded the peace of the Pyrenees, which put an end to the wars between France and Spain, and cemented it by a marriage between Louis and the Infanta. He died at Vincennes on March 9. M. was but little regretted. A courtier writing at the time says: 'Le roi est, ou paraît, le seul touché de la mort du cardinal.' He had accumulated immense wealth by very doubtful or equivocal means. His fortune is said to have amounted to near 8,000,000 sterling, all acquired in a period of external war or of internal commotion. The only productions of M. which have been pub. are his letters. The whole were collected and reprinted at Amsterdam in two vols. under the title of *Négociations secrètes des Pyrénées* (1745). The Abbé Allainval afterwards arranged these letters in chronological order, and, together with fifty unpublished letters, brought them out under the title of *Lettres du Cardinal Mazarin, où l'on voit le secret de la négociation de la paix des Pyrénées* (1745, Paris, 2 vols.). See A. Hassall, *Mazarin*, 1893, and H. Coville, *Étude sur Mazarin et ses démêlés avec Innocent X.*, 1914; also lives by K. Federn, 1922, and H. Tribout, 1933.

Mazarrón, tn. of Spain, in the prov. of Murcia, 20 m. W. of Cartagena. There are lead, iron, and copper mines in the neighbourhood. The port of M., on the Mediterranean, is a suburb, with a coasting and fishing trade, and salt works. Pop. 18,200.

Mazepa, Ivan Stepanovich (1645-1709), hetman of the Cossacks, b. at Mazeptzi, in the Ukraine. He became a page in the service of John Casimir, king of Poland. According to popular belief a Polish nobleman, having surprised him in an intrigue with his wife, caused him to be stripped naked and bound upon his own horse, and sent the animal off, leaving M. to his fate. The horse carried him to his own distant residence, but M. fled to the Ukraine, joined the Cossacks,

and in 1687 was elected their hetman. He won the confidence of Peter the Great, who made him prince of the Ukraine, but on the curtailment of the freedom of the Cossacks by Russia, M. conceived the idea of throwing off the sovereignty of the tsar, and so entered into negotiations with Charles XII. of Sweden. These and other treasons were revealed to Peter the Great, who did not credit the informants, but afterwards, being convinced of M.'s guilt, caused a number of his accomplices to be put to death. M.'s cap., Baturin, was destroyed and his Cossacks abandoned him. M. joined Charles XII. and took part in the battle of Poltava, after which he fled, in 1709, to Bender, and there died, probably a suicide. His story has been made the subject of a poem by Byron, of a novel by Bulgarin, and of two paintings by Horace Vernet.

Mazer. Brit. drinking-bowl, generally of maple wood, with a deep silver rim and a silver boss or print in the interior. It was formerly much used. A Scottish sixteenth-century example, the Watson M., was purchased by the Royal Scottish Museum, Edinburgh, with the assistance of the National Art Collections Fund, 1948.

Mazo de la Roche, see Di la Roche.

Mazovia, dist., well covered with pine and birch, for. rt. included in the N. of Russian Poland. During the reign of Sigismund I. (1506-48) it lost its independence of 100 years' standing, and was incorporated with the Polish kingdom.



Paul Popper

A POLISH MAZURKA BAND

Mazurka (Polish for 'a woman of Mazovia'), sprightly Polish dance, not unlike a polka, originating in the old palatinate of Mazovia, at least as far back as the sixteenth century. Chopin com-

posed many beautiful Ms., which are written usually in $\frac{2}{4}$ or $\frac{3}{4}$ time. The M. dance spread to Germany in the 1750s, thence to France, and in the first decade of the nineteenth century to England. The polka-M. differs from the M. in having an accent on the third beat of the measure, and from the polka in its triple time.

Mazzara del Vallo (ancet. **Mazara**), city in the prov. of Trapani, Sicily, 13 m. S.E. of Marsala. The chief exports are corn and oil. Pop. 22,000.

Mazzard, or **Gean** (*Prunus avium*), species of cherry-tree, which is found throughout Britain, but is probably native only in the S. It reaches a height of over 50 ft., with a trunk 7 ft. in girth and a spreading, loosely branched crown. The bark is a dull red, peeling in broad rings and marked with transverse stripes. It has long oval leaves, sharply toothed and somewhat drooping. Its large white flowers are borne in clusters. The fruits are dark red, with juice which stains. The H. is one of the parents of cultivated cherries, e.g. of the bigarpoons. The M. yields a fine timber, which has some resemblance to mahogany when polished and stained, and is used in cabinet-making, and also for pipes.

Mazzarino, tn. in the prov. of Caltanissetta, Sicily, 13 m. S.E. of Caltanissetta. Pop. 16,000.

Mazzini, Giuseppe (1805-72). It. patriot and republican, b. in Genou. He studied at the univ. of his native tn. and for four years practised as an advocate. In 1827 his maiden essay in literature, *Dell' Amor Patrio di Dante*, appeared in a Liberal jour. In 1830 M. joined the secret society of the Carbonari, and six months later was betrayed and banished from Italy. The organisation of a new Liberal league, 'Young Italy,' was M.'s next work whilst staying at Marseilles. Banishment from Marseilles, in consequence of the extensive operations of the society having been revealed to the authorities, compelled M. to hide for seven months. The first fruits of Young Italy was the revolutionary expedition of Savoy, organised by M. at Geneva, but which was defeated by the royal troops. Sentence of death, *par contumace*, was recorded against M. in the Sardinian courts for his participation in the affair, but he soon recommenced with increased vigour his revolutionary operations. A new association, entitled 'New Europe,' and based on principles of European rights and enfranchisement, was inaugurated by the exertions of M. in Switzerland.

In 1837 M. quitted Switzerland for London. From then on his labours in the It. revolutionary cause were incessant. The resolute combatant of partial union and monarchical leadership at Milan, M. retired to Switzerland on the capitulation of Milan to the Austrians, to reappear in Florence on the rising of Tuscany and finally at Rome, where he was elected Triumvir amidst triumphant rejoicings. His tenure of supreme authority was marked by wisdom, moderation, and success. On the surrender of Rome by

M.'s advice, he quitted the city and proceeded to Lausanne via Marseilles. The conduct of France he bitterly attacked in public letters to De Tocqueville and others. He subsequently returned to London, and at his instigation risings in Milan (1853) and in Piedmont (1857) were attempted. In 1859 he combated the threatened Fr. predominance, and refused to accord faith to the Liberal programme of Louis Napoleon. The Sicilian expedition of 1860 owed as much to the organisation of M. as to the heroic command of Garibaldi (*q.v.*). He constantly opposed the new It. monarchy and in 1870 he was arrested at sea and imprisoned at Gaeta. He d. of pleurisy at Pisa.

M.'s contribution to the unification of Italy was, in its early stages, of great value. He unified and vitalised the struggling aspirations of the It., by his idealism. But his solution, a republic, was not in accordance with political realities, and the future lay with the Piedmontese monarchy and its greatest statesman, Cavour (*q.v.*).

His best work is *Il Dovere del' Uomo* (1858) (*The Duties of Man*, trans. 1862; see Everyman's Library). See *Life and Writings*, 1864-70, and *Scritti edite e inediti* (18 vols.), prepared by himself, and the eds. of A. Saffi, W. Clarke, Moniglino, J. A. R. Marriott, and Bolton King in Everyman's Library; also his *Letters*, trans. into Eng. and ed. by Bolton King, 1929, and *Select Writings*, ed. by N. Gangula, 1945. See also lived by Bolton King, 1902; A. Redinian, 1922; and I. Silone, 1948; also Bolton King, *History of Italian Unity*, 1934.

Mazzucchelli, or **Mazzucchelli**, Giovanni Maria, Count of (1707-65). It. man of letters, had charge of the library which Cardinal Quirini had given to Brescia, and was a collector of books, medals, and antiquities. His ambitious hist. of It. literature entitled *Scrittori d'Italia* (1753-1763) did not advance beyond the letter B.

Mbabane, tn. of Swaziland, S. Africa, 12 m. N.W. of Brumersdorp. It became the seat of gov. in 1905. There are tin mines. White pop. 320.

McFall, Frances Elizabeth, see GRAND, SARAH.

McNeill, Ronald John, see CUSHENDON, BARON.

Mdina, anct. cap. of Malta; founded by the Romans, and remained the prin. tn. of the Is. until superseded by the foundation of Valletta in 1565. M. has many Rom. remains, including those of monumental buildings, and also catacombs of various periods. The cathedral church of St. Paul was founded by the Normans in the twelfth century; it was ruined by an earthquake in 1693, and rebuilt in the baroque style. M. is a city of churches. The chief church after the cathedral is that of the Carmelites, founded 1570, but much modified in the seventeenth century. The par. of M. is a large one, embracing much of the rural area in the centre of the Is. The only church to suffer damage from raids in the Second World War was the tiny chapel of Our Lady of Victory, a building dating from the fifteenth cen-

tury. Perhaps the most important monuments of M. are the series of early Maltese palaces, very small buildings of stone with their first floors lit with two-light windows of early Gothic form, and dating from the end of the fifteenth century. Among notable buildings of later times are the seventeenth-century archbishop's palace and the later Vilhena Palace. The whole place retains an atmosphere of medieval Europe to a unique degree, and fortunately the few bombs which fell within its high-bastioned walls caused little damage in the narrow streets. See also RABAT.

Mead, Richard (1673-1754), Eng. physician, b. in Stepney, London, and educated at Utrecht, Leyden, and Padua, was appointed medical adviser to George II. (1727). He held the post of physician at St. Thomas's Hospital, London, from 1703 to 1754. He wrote numerous treatises, including *Mechanical Account of Poisons* (1702), an account of snake venoms, and advocated quarantine and disinfection for plague, and inoculation for smallpox.

Mead, fermented liquor made by dissolving honey at the ratio of 4 lb. to a gallon of water and boiling it with spices. On cooling 1 oz. of brewer's yeast per gallon is added, and after standing for about 8 hrs. it is poured into a barrel to ferment. When fermentation ceases a small quantity of isinglass is added to clear the liquid. After bottling it is stored for six months or more, when it is ready for use as a dry table wine. Special licences for its sale are necessary. Sack M. and sack metheglin are varieties of M.

Meade, George Gordon (1815-72), Amer. general. He first won distinction in the Mexican war, where he attained the rank of captain of engineers, and fought in the civil war as brigadier-general of volunteers. Lincoln placed M. in chief command of the Union army in place of Hooker. In July 1863 he defeated the Confederates under Lee at Gettysburg, though his own casualties were great. When Grant was made commander-in-chief of the Union armies he retained M. as his right-hand man in all the subsequent campaigns in Virginia. See life by J. R. Pennypacker, 1901.

Meadow Grass, the genus *Poa*, and specially *P. trivialis* and *P. pratensis*; hay and pasture grasses, with flat pale-green leaves and pyramidal panicles of flowers. *P. nemoralis* is the wood M. G.

Meadow Rue (*Thalictrum florum*), perennial herb of the order Ranunculaceae, with a creeping root-stock and tall furrowed stems. It has small yellow flowers clustered in a pyramid.

Meadow Saffron, see COLCHICUM.

Meadow Sweet, or **Queen-of-the-Meadows** (*Spiraea ulmaria*), tall plant (family Rosaceae), with compound cymes of fragrant, creamy-white flowers and pinnate leaves. It is common in pastures.

Meadville, city of Crawford co., Pennsylvania, U.S.A., 33 m. S. of Erie. It manufactures, rayon, and zip-fasteners, and lies in a rich farming country. Alleghany Methodist College is at M. Pop. 18,000.

Meagher, Thomas Francis (1823-67), Irish politician, b. at Waterford. He joined the Young Ireland party, and in 1848 was condemned to death for his revolutionary propaganda. The sentence was commuted to exile, and he escaped (1852) to America, where, on the outbreak of civil war (1861), he organised the Irish brigade for the Federals, and was for a time governor of Montana.

Meagre (fish), see MAIGRE.

Meal Tub Plot, fictitious plot hatched by Thomas Dangerfield (q.v.) in 1679 with the connivance of a Mrs. Cellier (who was known as 'the popish midwife,' and was almoner to the countess of Powis) when it was profitable to needy villains to concoct imaginary plots against the king and the estab. religion. From the papers found in meal tub in Mrs. Cellier's house, it seems to have been designed to implicate the duke of Monmouth and the Catholics in a pretended plot to establish a commonwealth and overthrow Protestantism. Sir Wm. Waller searched Mrs. Cellier's house and found therein, concealed at the bottom of a meal tub, the 'little paper book, tied with red ribbons,' containing 'the model of the designed plot against the Protestants.' Dangerfield, by turning king's evidence in another trial, secured a pardon, and Mrs. Cellier was acquitted.

Meal-worm, larva of a common beetle (*Tenebrio molitor*), frequenting mills, granaries, and bakehouses. It is thin and round, about 1 in. long, and tawny in colour, with bright rusty bands. The beetle is 1 in. long, with stout legs and eleven-jointed antennae and black and red in colour.

Mealy Bug, homopterous insect, which does considerable harm to plants in greenhouses by sucking the sap and by choking the pores of the leaves. The insects are minute and red in colour, but a covering of white mealy powder disguises them. The males have wings, but the females are wingless. The pest is destroyed, with difficulty, by spraying with insecticide; fumigation with tobacco smoke or cyanide of potassium is more effective.

Mean, in philosophy, is applied to a doctrine of Aristotelian ethics. According to Aristotle, virtue consists in finding the M. (*τὸ μέσον* or *μέσης*) between all extremes, because all desire tends to excess, and excess is the danger of life. According to the genuine exposition of it, this doctrine is not a mere counsel of apathy, but that of a middle course between passion and apathy. See Aristotle, *Nicomachean Ethics*, books i.-iii., and Sir A. Grant, *Aristotle's Ethics*, 1877; E. Wallace, *Outlines of the Philosophy of Aristotle*, 1883; D. Stewart, *Notes*, 1892; and W. D. Ross, *Aristotle*, 1923.

Meander (Lat. *Maander*, Gk. *Μαιάνδρος*), appellative use of the name of a riv. in Phrygia noted for its winding course. See MEANDER.

Mean Sea Level. There is no absolute invariable figure which may be taken as indicating M. S. L. From a world point of view it is a local convention. If the whole globe were covered with a uniformly deep ocean, and if there were no

differences of density between one part and another, the surface would form a perfect ellipsoid of revolution, that is to say, all the meridians would be exactly equal ellipses and all parallels perfect circles. But as the water surface is broken by land, and as the mean density of the substance of the land is 2·6 times as great as that of sea water, the gravitational attraction of the land must necessarily cause a heaping-up of the sea around the coasts forming what has been called the continental wave, and leaving the sea level lower in mid ocean. Hence the geoid or figure of the sea surface is not part of an ellipsoid of rotation, but is irregular.

The differences of level between different parts of the geoid, i.e. in different seas and oceans, have in the past been greatly overestimated. The inequalities of the geoid are now considered in no case to exceed 300 ft. Distortion of the ocean surface may also arise from meteorological causes. Solar radiation does not account for a difference of level of more than 20 ft. between tropical and polar seas; the range of temp. between summer and winter in the Baltic is as much as 20° F., but this only corresponds to a difference of level of $\frac{1}{4}$ in.

In the Brit. Isles the ordnance survey datum level used to be referred to a benchmark on a dock wall in the tidal riv. at Liverpool, which was supposed to represent M. S. L. as ascertained nearly 100 years ago, but was based on a fortnight's observation only.

This datum has since been considered unsatisfactory for scientifically accurate observations. Newlyn, situated on the open sea, was therefore chosen; and the Newlyn datum is the M. S. L. at that place as computed from hourly observations over a period of six years, 1915-21. The new datum is shown on all 1/2500 and 6-in. ordnance survey maps pub. since April 1929.

Means Test, in connection with applications for transitional unemployment benefit, connotes the statutory test of the applicant's means in order to arrive at the amount of assistance for which he is eligible. It was introduced in 1931. In 1932 the Labour party complained bitterly of the retention of the M. T., but the gov. retained the test in principle, though in its Bill of 1933 it proposed that the test of need should be the income of the household. This proposal found expression in the regulations made under the Unemployment Assistance Act, 1934, which provide that the amount of allowance granted shall be determined by reference to the applicant's needs, and for this purpose the resources of all members of his household are required to be known. The M. T. was replaced by the provisions of the National Insurance Act (1946) (q.v.).

Mean, The, in mathematics, of two or more quantities is an intermediate quantity determined by certain rules. The most common Ms. are the arithmetic M., the geometric M., and the harmonic M. The arithmetic M. is the average value of the quantities, the geometric M. is the

square root of the product of the quantities, and the harmonic M. is the arithmetic M. of reciprocals.

Mearns, Renfrewshire, see NEWTON MEARNS.

Mearns, The, see KINCARDINESHIRE.

Measham, par. and vil. of Derbyshire, England, 4 m. S.W. of Ashby-de-la-Zouch. Red bricks and terra-cotta are manufactured, and there are coal-mines in the vicinity. Pop. 2300.

Measles, acute infectious disease, characterised by reddish eruptions on the body and catarrh of the mucous membranes of the air passages, conjunctiva, etc. It is one of the commonest infectious diseases in England, occurring in scattered cases at all times, and in rapidly spreading epidemics at frequent intervals. It attacks children for the most part, and is usually disseminated by the congregation of children in school. The rate of mortality is low, but there are certain dangers arising from possible complications which render it desirable to prevent the frequent epidemics. Like smallpox, it is presumably caused by an infective virus. Canon and Pelicke have isolated a minute bacillus that appears characteristic of the early stages of the disease, but its occurrence appears to be a result rather than a cause of the conditions set up by the disease. An attack of true M. (*Rubella* or *Morbilli*) confers immunity from subsequent attacks to the end of life. The early symptoms are so indefinite that contagion often spreads before the disease is recognised. After from seven to fourteen days' incubation, catarrh of the mucous membranes sets in. The eyes become red and watery, there is a watery discharge from the nose, a dry cough, sore throat, thirst, restlessness, and a high temp. After three or four days small dark-red spots appear on the face and neck, and the face becomes swollen; they are sometimes preceded by a rash inside the mouth ('Koplik's Spots'). The eruption extends downwards until the whole body is involved. The rash fades away in the same order as it attacked the body. The red spots become yellowish, and the skin crumbles off in a powder resembling bran. The duration of the eruption from first to last is about a week, and during that time the febrile conditions increase until the temp. is about 101° or 105°. At the height of the eruption the temp. usually falls, and convalescence proceeds rapidly. Inflammation of the air passages may persist and lead to bronchial trouble. The eyes may remain irritable, a degree of diarrhoea may persist, or the general vitality of the patient may be so affected that liability to tubercular affections is increased. There may be infection of the ears, leading to deafness. After recovery the patient should be sheltered from cold and unhygienic conditions for a lengthened period, as much of the mischief arising from M. is due to a premature neglect of the precautions proper to a state of convalescence. The actual fever stage in the mild form of the disease requires little treatment other than that associated with febrile conditions generally. Efforts should be made to

prevent the spread of the epidemic by isolating proved and suspected cases. Schools are usually shut when an epidemic threatens a neighbourhood. *German measles, Rubella, or Roseola*, is a mild infectious disease characterised by an eruption similar to that of M., but in a milder form. Febrile symptoms are not marked or are absent altogether.

Measure, in music, is an old-fashioned term for a rhythmic phrase or dance.

Measures, see WEIGHTS AND MEASURES.

Meat, term formerly applied to food, particularly solid food. It is now restricted, except for a few surviving phrases to butcher's M., or the muscular tissues of such animals as bullocks, sheep, pigs, etc. M. as an article of food owes its value to the large amount of available protein it contains and its appeal to the appetite when well cooked. The supply of M. is now regularised by the adoption of methods of preservation by means of which the supplies of thinly populated countries are made available for the whole world, and for almost any length of time. The modes of preservation used are *heat*, as in the great canning industry of Chicago; *cold*, as in the preparation and shipment of M. from the Argentine, New Zealand, Australia, etc.; and *salting*, or impregnating with brine. The drying of M. for preservation for any length of time is now practically obsolete. M. extracts are made by processes arising from that initiated by J. von Liebig; the soluble water is removed from the M. and condensed to a small compass by evaporation *in vacuo*. The food value of M. extract depends more upon the stimulating character of the material rather than on any amount of protein it may contain. The protection of the public against unsound M. is in the hands of the medical officers and inspectors of nuisances attached to the various bor. and dist. councils. The Public Health Act, 1875, and subsequent amendments, provide for the inspection of slaughterhouses and the destruction of M. shown to be unsound. The three great cattle-raising areas of the world are Argentina, Australia, and Iowa in the U.S.A., where the cattle are 2111, 1771, and 1811 respectively to each 1000 of pop. These figures can be best realised by comparison with the United Kingdom, where there are 199 cattle to each 1000 of pop. Argentina and the other M. countries of the R. Plate, Uruguay, and Paraguay are fortunate in having the best natural feeding substances for cattle rearing, and an exceedingly mild winter that enables rearing to be carried on at low cost. The cattle fatten rapidly and, where alfalfa is used as a food, multiply rapidly.

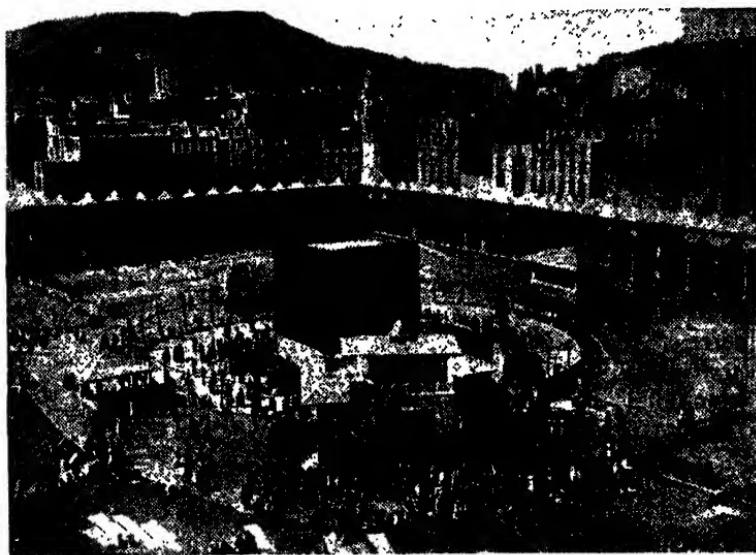
Meath, maritime co. in the prov. of Leinster, Eire, bounded E. by the Irish Sea. The surface is mainly flat, rising towards the W., and the coast is low and sandy. The chief riv. is the Boyne, into which flows the Blackwater. Agriculture flourishes, oats being the prin. grain crop; cattle and sheep are reared in considerable numbers. There are some woollen manuf., and linen is woven by handlooms. There

are some fine old ruins at Duleek, Beehive Abbey, and Clonard, and a castle at Trim, the co. tn. Tara, the supposed site of the old Irish cap., with its palace, is in the co. Five members are returned to the Dail by M. and Westmeath. Area 904 sq. m. Pop. 66,200.

Meat Poisoning, see BOTULISM.

Meaux, tn. in the dept. of Seine-et-Marne, France, on the Marne, 26 m. E.N.E. of Paris. It possesses a twelfth-century cathedral. Dairy produce and corn are the chief products; sugar, steel, and cotton goods are manufactured. Pop. 14,200; arron. 158,900.

tion; the chief articles manufactured there are chaplets for the pious pilgrims. Respecting the hist. of M., it was known to Ptolemy already as Macoraba, and first belonged to the tribe of the Kosaltes, later to the Korcish. Mohammed, who had been obliged to leave it precipitately (*see HENNA*) in 622, returned to it and conquered it in 627. M. was taken by the Wahabis (1803), but given up again to the pasha of Egypt, Mehemet Ali (1833), whose son, Ibrahim, was made Sheik El Haram (of the sacred place). On Oct. 13, 1924, the Wahabis again captured M., and in 1926 Ibn Saud was proclaimed king of



THE KAABA, MECCA

E.N.A.

Mecca (*Qm Al Kora*, mother of cities), one of the oldest tns. of Arabia the cap. of the prov. of Hedjaz, and, through being the bp. of Mohammed, the central and most holy city of all Islam. It is situated 245 m. S. of Medina, and about 65 m. E. of Jiddah, the well-known port on the Red Sea, in a narrow, barren valley, surrounded by bare hills and sandy plains and watered by the brook Wadi-Al-Tara-feyn. The inhab. of M. make their living chiefly by letting their houses to the pilgrims (*see HADJ*), who flock hither to visit the chief mosque, containing the Kaaba (q.v.). This mosque, capable of holding about 35,000 persons, is surrounded by nineteen gates surmounted by seven minarets. A great number of people are attached to the mosque in some kind of eccles. capacity, as khatib, muftis, muaddins, etc. It is protected by three castellated buildings, and is governed by a sheriff. The trade and commerce of M. hardly deserve men-

the Hejaz in M., his predecessor King Ali being forced to abdicate. Later, when the Hejaz and the Nejd were united as Saudi Arabia, the constitution of 1926 provided for a consultative Legislative Assembly at M. M. has a wireless station. The road from M. to Jeddah (45 m.) is partly metalled, and motor omnibuses ply between the two tns. A certain balm, called balm of M., is made here. Permanent pop. (estimated) 70,000, floating pop. 100,000. See C. S. Hurgrove, *Mecca*, 1888; A. Warrell, *A Modern Pilgrim in Mecca*, 1912; and E. Rutter, *The Holy Cities of Arabia*, 1928.

Mecca Stones, see MOCHA STONES.

Mechain, Pierre François André (1744-1803), Fr. astronomer, b. at Laon. He worked at the Paris observatory, and besides discovering eleven new comets calculated the orbits of another twenty-four. From 1791 he was engaged in surveying the arc of the meridian between

Rodez and Barcelona. Dalambre's *Système métrique* tells how accurately he fulfilled his task, and gives also a sympathetic picture of the man himself, a victim to despondency and the stress of hostile circumstances.

Mechanical Accounting, see CALCULATING MACHINES; ELECTRIC ACCOUNTING MACHINES.

Mechanical Differential Analyser. The differential analyser is a machine for solving differential equations, which occur frequently in scientific and engineering problems. It consists of a number of units which can be mechanically interconnected through gears and gear units in a variety of ways by rotatable shafts.

and output tables, on which the solution of the equation is delivered in the form of a graph. The solution can also be obtained in numerical form. The shaft whose rotation represents the independent variable is driven by an electric motor, and other motors drive the torque amplifiers. The running of the machine is controlled by push-buttons at convenient points.

Mechanical Engineering, branch of engineering that deals with the theory and practice of all mechanical means of transport, e.g. railway, marine, automobile, and aeroplane engineering. It also includes the theory and practice of power generation and transmission and the production



Metropolitan-Vickers Electrical Co. Ltd.

THE MECHANICAL DIFFERENTIAL ANALYSER AT MANCHESTER UNIVERSITY

Designed on a unit principle, it can solve a wide range of differential equations. The machine illustrated has eight integrator units, six input boards, one output board, and occupies a floor area of about 27 ft. by 10 ft.

The rotation of each shaft represents one of the variables in the differential equation, and the shafts can be connected together in such a way that the relation between their rotations satisfies the equation. The adaptability of the machine depends on the wide range of possibilities of these interconnections. The essential units are called integrators, which each consist of a vertical wheel resting on a rotatable horizontal disk, the distance from the centre of the disk to the point of contact with it being continuously variable. The rotation and displacement of the disk represent the variable of integration and the integrand respectively, and the rotation of the wheel represents the result of integration. In order to avoid error due to slip of the wheel on the disk, a 'torque amplifier,' with an amplification up to 10,000 to 1, is inserted between the wheel and the shaft to which it is connected. Other units are input tables, which are used for supplying to the machine information in the form of a functional relation between two variables,

of machine tools. Courses in M. E. are provided at all the univs., and at many of the technical colleges in Great Britain, from whom prospectuses may be obtained. The Institution of Mechanical Engineers was founded in 1847 by George Stephenson. See J. Horner, *Dictionary of Mechanical Engineering Terms*, 1933; C. H. Tuppen, *Modern Engineering*, 1942; and D. A. Low and B. B. Low, *A Pocket-book for Mechanical Engineers*, 1944.

Mechanical Handling, see CONVEYORS.

Mechanics, science which considers the laws involved when bodies are acted on by forces which keep them in equilibrium or which produce motion in them. M. is arbitrarily subdivided into statics (including hydrostatics) and dynamics (including aerodynamics and hydrodynamics), the former branch treating of forces in equilibrium, and the latter dealing with forces acting so as to produce motion. Not only does M. deal with the direct action of forces on bodies, but it also studies the nature and action of forces

when they act on bodies by the agency of machinery. This gives the origin of the word M., and as a matter of fact M. was in its early stages the science of making machines. A machine in M. means any contrivance in which a force applied at one point is made to raise a weight or overcome a resisting force acting at another point. All machines can be reduced down to three primary machines, viz. the lever, inclined plane, and pulley; and three secondary, derived from these, viz. the wheel and axle, wedge, and screw for the properties of each of which see the articles dealing with them. These six machines are sometimes known as the mechanical powers. An account of the application of these mechanical powers in the construction of complex machines would involve descriptions of most of the engines by which human labour is abridged or dispensed with. It will be seen, therefore, that M. is of the utmost importance in structural engineering. M. is essentially an experimental science: all its laws are based on intuitive deductions from experimental observations. This is true, for example, of the three great laws of M. enunciated by Newton. M. has its origin in the mechanical powers that were employed long before any formal principles governing their action were discovered. Archimedes (*q.v.*), by his investigations of the principle of the lever and the property of the centre of gravity, estab. M. as a science. After Archimedes little progress was made until the time of Stevinus (1548-1620), who investigated the principle of the inclined plane. The golden age of M. began when Galileo (*q.v.*) made the first inquiries into problems of motion. Aristotle had taught that the speed with which a body falls is directly proportional to its weight. Galileo proved this to be false by letting two weights fall from the top of the Leaning Tower of Pisa; he subsequently deduced the solution to the problem of falling bodies, and he re-examined the previous knowledge of M. Newton (*q.v.*) took up the subject after Galileo, and his contributions to it were so great that his three laws remain the fundamental laws of M. to-day. His theory of universal gravitation enabled him to account for the motions of the members of the solar system as well as the motion of bodies on the earth. Lagrange and Laplace developed the subject in the eighteenth century, and at the present time Einstein and others are examining the philosophical foundations of the subject. See also DYNAMICS; ENERGY; FORCE; HYDROKINETICS; HYDROTSTATICS; KINEMATICS; KINETICS; STATICS. See Sir A. Kennedy, *Mechanics of Machinery*, 1886; J. Goodman, *Mechanics applied to Engineering*, 1899, 1926-27; C. W. MacCord, *Kinematics*, 1901; A. Sommerfield, *Wave Mechanics*, 1929; G. P. Thomson, *Wave Mechanics of Free Electrons*, 1930; T. Barraclough and E. J. Holmyard, *Mechanics for Beginners*, 1931. Mechanicsville, tn. of Saratoga co., New York, U.S.A., situated 17 m. N. of Albany. It manufs. bricks, shirts, and knitted goods. Pop. 7400.

Mechanicsville, Battle of, first of the

'Seven Days' Battle' of the civil war, sometimes known as the battle of Beaver Dam Creek.

Mechanisation, substitution of mechanical for manual operation in industry. The Eng. industrial revolution of the eighteenth - nineteenth centuries released new sources of energy and new materials for the production and transportation of goods, but it only mechanised the actual working process in certain simple crafts, such as spinning and weaving. Its most representative creation was, in fact, the engineer, the last, most highly skilled of all craftsmen. In the progress (or evolution) to a more complete and real M., America has led the way in the course of the last hundred years by the M. of the most complex manual skill, including that of the engineer, as well as most other crafts which had survived unchanged for centuries. The dual agencies through which this result was achieved are motion study and the production line, the former carrying the principle of division of labour to its logical mathematical conclusion, and adapting it to the continuous flow of the production line. M. is complete when the human hand is replaced in the production line by self-acting tools, so that the workers cease to be operators and become machine-minders. This final stage has so far only been achieved in a few industries, even in the U.S.A. Hence the present stage of M. is still mainly opposed to the true interests of the worker; for his part in production is so monotonous that he loses all interest in it. M. has, indeed, been regarded as one of the fundamental causes of the split between thought and feeling which is so characteristic of the present age. See also MASS PRODUCTION IN THE U.S.A. See S. Giedeon, *Mechanisation takes Command*, 1949.

Mechanisation and Motorisation, Military. These terms are often used synonymously, but properly speaking mechanisation means the employment of arms which depend for their functioning entirely on mechanical means (*e.g.* tanks, some forms of engineer equipment, and A.A. gear), whereas motorisation means the transport and supply by motor vehicles of men, arms, and equipment which are also capable of being moved and maintained by other means.

Both are costly processes, and the mechanisation of the forces of a great power depends closely upon the peace-time industrial development (especially metallurgical) of that power. Motorisation again depends on the size and efficiency of its automobile industry. No power could afford to purchase the whole, or even a considerable part, of its mechanised and motorised equipment from abroad. Thus, though lacking specialised equipment such as tanks and anti-tank guns in 1939, the Brit. Army was at that time completely motorised, though the home forces were equipped largely with impressed civilian vehicles, while even at the height of its efficiency the first-line transport of the bulk of the Ger. Armies depended on horse

traction, in spite of the fact that the Ger. motor industry had been coerced in the years immediately before the war into adopting a standardised programme of production of vehicles (such as the *Volkswagen*) which could be immediately adapted to military use: the strategic moves of the Ger. Army, from the Russian to the W. front, were carried out by rail. By 1945 the two powers most conspicuous for mass production and mass employment of tanks were precisely those whose peacetime industries had the highest output of heavy agric. tractors, the U.S.A. and the U.S.S.R. Tanks and motorised troops played a relatively small part in the great successes of the Jap. Army, who fought their war in a style consistent with an economy whose forte was light industry and shipping. The armies of Poland, Hungary, and the Balkan states can hardly be said to have known mechanisation or motorisation up to 1939.

The experience gained by the Brit. Army in the campaigns of the First World War waged in defence of the Suez Canal, and the constant preoccupation of the imperial general staff with the security of the Middle E., would alone have been sufficient to account for the almost complete elimination of cavalry, horse artillery, and animal transport from the Brit. Army before 1938. Hippomobile armies, apart from their extreme vulnerability from the air, require enormous quantities of forage and water, in addition to the normal burden of rations and ammunition, and the supply of a great cavalry army for any length of time in arid zones, such as Mesopotamia and the Syrian and W. deserts, was an impossible task. See TANKS; ARMoured CARS; INFANTRY; ARTILLERY.

Mechelen (Fr. Malines), city of Belgium, 14 m. S. of Antwerp, on the R. Dyle. It has a cathedral with an unfinished steeple of 318 ft., containing a famous chime of forty-five bells. There are sev. other churches in M., some of which contain pictures by Rubens. Of those the finest is that of 'The Adoration of the Magi' in the church of St. John. There are also sev. secular buildings, giving evidence of the wealthy past of the city. The Cloth Hall was built in 1320, and the old palace of the Grand Council of the Netherlands in 1374. M. was formerly known for its lace manufs. At present there are very important furniture manufs. It produces also textiles, tapestry, and tinned vegetables. There is a large workshop of the Belgian Railway Company. The surrounding dist. is famous for the cultivation of early vegetables, of which M. is an international market. It is the see of an archbishop, primate of Belgium, and there are two convents. M. suffered much in the early stages of the First World War during the battle of Antwerp; afterwards it was famous as residence of Cardinal Mercier. During the Second World War M. was bombed sev. times, and damage was done. Pop. 60,200. See L. Godenne, *Malines jadis et aujourd'hui*, 1918, and J. Laenen, *Geschiedenis van Mechelen tot op het einde der middeleeuwen*, 1926.

Mechlin Lace, see under LACE.

Mechnikov, Ilya, see METCHNIKOV.

Meckenem, Mekenem, or Mechelin, Israel von (d. 1503), engraver and goldsmith, is usually identified with the Ger. painter, Meister Israel, eighteen of whose works hang in the Pinakothek of Munich. They are religious in subject, and belong clearly to the school of Van Eyck.

Mecklenburg, prov. of Germany, formed of the two former grand duchies, M.-Schwerin and M.-Strelitz, the areas of which are respectively 5068 sq. m. and 1131 sq. m. Schwerin is watered by the Elbe and Warnow, and its surface is generally flat and well wooded. Strelitz is also flat and similar in its physical character to Schwerin, although being further from the sea its climate is less humid and less changeable. Agriculture is the chief industry of M., and stock-raising is an important pursuit. Gypsum and salt are mined in Schwerin. The title of grand duke was obtained for Schwerin and for Strelitz in 1815. Until 1907 both duchies were practically absolute monarchies, but in that year they were granted some form of constitutional government. In 1934 they were united. The chief tns. are Schwerin (54,000); Ludwigslust, Rostock (heavily damaged by the R.A.F. in 1942), with a pop. of 95,000 in 1940; Güstrow; Wesmar; and Strelitz. Pop. 2,139,700.

Mees, Ladislás (real family name Martonosik), b. 1895, Hungarian poet. He completed his studies at Budapest, and became canon of a Fr. order of priests, who made him a prof. for a time, and then assigned him to a vil. par. He has written three books of poetry: *Angelus of the Dawn* (1923); *Slaves Sing* (1925); and *Consolation* (1927). He has made himself pre-eminently the poet of his own country-side, and of the poor.

Medallions, large medals struck for a particular occasion. In architecture round or oval panels and tablets, often decorated with designs or figures in relief, are called M. in reference to their shape. See under MEDALS.

Medals. Numismatists have usually given the name of medal or medallion to those coin-like pieces that have been struck or cast for particular purposes or on extraordinary occasions, in commemoration of victories, treaties, coronations, and other important events, or in honour of remarkable persons, in contradistinction to coins, which have been issued for circulation as money. The art of engraving dies is of very antq. origin (see NUMISMATICS). In some parts of the Gk. world, especially in Sicily, coins struck for currency sometimes bore what may be called commemorative types, and so served one of the purposes of M., but true M. or medallions are rare; the only examples known before the Hellenistic age come from Syracuse, Agrigates, and Athens, the two latter being represented by one issue each. The later Syracusan series was definitely associated with games, a usage which recurs in Egypt under the Ptolemies.

Under the Rom. Empire the art of the

medallion was raised to a very high degree of skill and beauty of imperial portraiture. These large pieces, struck generally in bronze or silver, with some magnificent exceptions in gold, were produced at the order of successive emperors for distribution on special occasions to friends, court officials, army officers, and foreign rulers and envoys: many of them were provided with a loop for suspension.

In the early medieval period the It. term *medaglia*, first applied to large bronze Rom. coins or medallions, finally came to denote any subsequently made piece of similar bold size and elaborately finished style; and the It. Renaissance saw medallie art nobly developed by Pisano ('Pisanello') (c. 1390-1455) and Matteo de' Pasti, his younger contemporary, from both of whom the great It. school derived.



MEDAL STRUCK TO COMMEMORATE THE APPOINTMENT OF JAMES (THE FUTURE JAMES II.) AS ADMIRAL OF THE FLEET

One of the earliest pieces is a gold medal of the Council of Florence (1439). Papal M. begin with Paul II. (1464), those of earlier popes having been issued by their successors.

A second great school of medallists began in Germany in 1453, and Ger. M. came to display much originality and strength in treatment, though they were inferior to the It. in observing the limitations imposed upon the art by a circular shape. Sicilian M. appear as early as 1501; Sp. in 1503, and Dan. in 1516. Early Dutch M. (after 1566) are notable for their elaborate engravings of views, maps, and plans. Fr. M., which began in 1451 and developed under Dupré (1576-1643) and Warin (1600-72), were remarkably transformed by the reign of Louis XIV. (1643-1715), the events of which were mirrored in a long and splendid series of realistic design. The medallie hist. of the Napoleonic period, though of similar extent, is comparatively undistinguished through its addiction (with the *littérateurs*) to a false classicism.

The series of Eug. M. is one of the most perfect, though probably more notable for its representations of contemporary

events than for its artistic quality. The earliest example is a gold medal of Henry VIII. (Supremacy of the Church, 1545). Edward IV.'s reign supplies the first of a long series of coronation M. Among the best known die-engravers of Eng. M. are the Frenchman Briot, active under Charles I.; Thomas Simon, his near-contemporary and successor; the It. Benedetto Pistrucci, designer of the Waterloo medallion; and, later in the nineteenth century, Wm. Wyon, R.A. There are signs that in many countries the art of the medal is again claiming a place above that to which it sank in the late nineteenth century, and that it is vindicating its importance not only as an historical repertory of national events and nationally famous figures but also as a study peculiarly welcome for the collector of objects of virtu. The work of Theodore Spicer-Simson (q.v.) between 1910 and 1930 attained a fine distinction.

The striking of M. for the learned societies and (since 1849) for the services forms one of the regular functions of the Royal Mint in London.

See E. Hawkins, A. W. Franks, and H. A. Graeber, *Medallic Illustrations of the History of Great Britain and Ireland*, 1885; G. Tancer, *Historical Record of Medals and Honorary Distinctions*, 1891; L. Forrer, *Biographical Dictionary of Medalists*, 1904-30; G. F. Hill, *A Guide to the Exhibition of Historical Medals in the British Museum* 1924, and *A Corpus of the Italian Renaissance Medals*, 1930; J. Babalon, *La Médaille et les médailleur*s, 1927; and H. Taprell Dorling, *Ribbons and Medals*, 1947.

Medals, First and Second World Wars (British). See under title, e.g. WAR MEDAL, BRITISH; VICTORY MEDAL; STAR, 1914: 1914-15 (First World War)—BURMA STAR; DEFENCE MEDAL; ITALY STAR (Second World War).

Medan, tn. of N. Sumatra, situated about 10 m. from the W. coast on the R. Delti. Here is one of the high courts of justice of the Dutch E. Indies. Pop. 10,000.

Mede, or **Mead**, Joseph (1586-1638), Eng. scholar, took his M.A. degree from Christ's College, Cambridge, in 1610, and was associated with his college as fellow and reader in classics for the rest of his life. His *Claris Apocalyptria* (1627) is a reasonable exposition of the apocalyptic prophecies.

Mede, tn. in the prov. of Pavia, Lombardy, Italy, 22 m. W.S.W. of Pavia. Pop. 6500.

Medea (Gk. Μήδεια), in Gk. mythology, a famous sorceress. She was the daughter of Aeëtes, king of Colchis, and the wife of Jason, with whom she fell in love when he came in search of the golden fleece. She assisted him in his quest, and together with her brother, Absyrtus, embarked with him in the *Argo*, but being pursued by Aeëtes she murdered her brother and scattered the parts of his body into the sea, thus doleing her father. At length she arrived at Iolcus with Jason, and from there they went to Corinth, where they lived happily for about ten years, until Creon, king of Thebes, betrothed his

daughter Glauce to Jason. This led him to desert M., and for his faithlessness she exacted a terrible revenge. She killed both the bride and her father by sending the maiden a poisoned robe and diadem, and murdered her two sons, Mermerus and Pheres, in her husband's sight. After this she fled from Corinth in a car drawn by dragons, the gift of her grandfather, Helios, to Athens, where she married Aegeus, by whom she had a son, Medas, who was regarded as the progenitor of the Medes. Being forced to leave Athens, she returned with her son to Colchis, and restored her father to the throne of which he had been deprived by his own son Perseus. At Corinth she was deemed immortal, and was said to have become the wife of Achilles in the Elysian fields, but elsewhere she was merely regarded as an auct. queen. See Euripides, *Medea*, trans. by G. Murray, 1906, and F. L. Lucas, 1924.

Medea (auct. *Lamida*), tn. of Algeria, situated 40 m. S.W. of Algiers. Pop. 17,000 (Europeans 4000).

Medellin, chief tn. of the dept. of Antioquia, Colombia. It is an episcopal see, has a univ., and is the second largest tn. of the republic. There are rich gold and silver mines in the vicinity. The inhab. are chiefly engaged in the manuf. of jewellery, porcelain, and pottery. Coffee is grown and exported; silk, cotton, wool, and chocolate are also produced. There is an air-line to Panama. Pop. 224,200.

Medes, or Medians, see under MEDIA.

Medford: 1. City of Massachusetts, U.S.A., in Middlesex co., situated on the Mystic R. and lakes, 5 m. N.N.W. of Boston. The manufs. include woollen goods, food products, machinery, and chemicals. Pop. 63,000. 2. City of Oregon, U.S.A., cap. of Jackson co., 4 m. N.E. of Jacksonville, with sugar refining and brewing industries. Pop. 11,200.

Medhurst, Walter Henry (1796-1857), Eng. missionary in China. b. in London, was ordained at Malacca in 1819, and after working in Penang and Batavia founded a mission in Shanghai, with which he was associated from 1842 to 1856. He issued a very accurate version of the Bible in High-Wen-hi, his version being a revision of the old Chinese text. He was part author of a trans. of the N.T. into the Mandarin dialect of Nanking. He pub. also a Jap.-Eng. dictionary (1830) and a Chinese-Eng. dictionary (1842-43).

Media, in auct. times, the name of the N.W. part of Iran, corresponding to the present provs. of Azerbaijan, Ghilan, Mazandaran, Irak-Ajemi, and the E. portion of Kurdistan. The Medians were in language, religion, and manners very nearly allied to the Persians. After they had shaken off the yoke of the Assyrians, their tribes, according to the common account, united about 708 B.C., chose Deloec (Kai-Kobad) for their chief, and made Ecbatana their cap. His son, Phraortes, or Arphaxad, subdued the Persians. Cyaxares (Kai-Kaous), the son of Phraortes, in alliance with Nabopolassar, king of Babylon, overthrew the Assyrian empire about 604 B.C., and vanquished the brigand hordes of Scythia. He was suc-

ceeded by his son Astyage (Asdehak), who was deposed (580 B.C.) by his own grandson, Cyrus (Kai-Khusru), king of Persia, and from this time the two nations are spoken of as one people. Ecbatana, the cap. of M., became the summer residence of the Persian kings. With the overthrow of the Persians by Alexander the Great after the battle of Arbela (331 B.C.) M. became part of Alexander's realm. After the death of Alexander the Great (324 B.C.) the N.W. portion (*Atropatene*) of M. became a separate kingdom, and existed till the time of Augustus, the other portion, under the name of Great M., forming a part of the Syrian monarchy. M. was on sev. occasions separated from Persia. In 152 B.C. Mithridates I. took Great M. from the Syrians and annexed it to the Parthian empire, and about 36 B.C. it had a king of its own, named Artavasdes, against whom Mark Antony made war. Under the Sassanian dynasty the whole of M. was united to Persia. It became, during the fourteenth and fifteenth centuries, the stronghold of Turkoman tribes. In early times the Medes were a warlike race, and distinguished for their skill with the bow. They were also celebrated for their horsemanship, and it was from them that the Persians adopted this and other favourite exercises. See J. von Prásek, *Geschichte der Meder und Perser*, 1906 10; II. H. Rowley, *Darius the Median*, 1935; and G. G. Cameron, *History of Early Iran*, 1936.

Medias (Hungarian *Medgyes*), tn. of Rumania in Transylvania, situated on the Great Kokel, 25 m. N.N.E. of Sibiu (Hermannstadt). Pop. 15,500.

Mediation, Act of, Swiss constitution, the work of Napoleon, was drawn up in 1803. Prior to the treaty of Lunéville Fr. troops had been in occupation of Switzerland; but, after that treaty, it was politic for Napoleon to evacuate his forces and help the Swiss to settle down; for in this way he would be certain of this strategically important ter. The A. of M., which was drafted with the aid of delegates from the various cantons, revived the former diet, the president formally representing the central gov., but having no executive power. There were to be nineteen cantons; the Diet was to meet in turn at the six large tns., and France was to guarantee the Swiss neutrality. This constitution came to an end in 1813.

Mediatisation (Ger. *Mediatierung*) is derived from Lat. *mediatus*, middle, and was coined to describe the process by which the title of certain Ger. princes was subordinated to that of other sovereigns, instead of being held directly from the emperor. Many minor houses were mediatised in 1803, and again in 1815 at the congress of Vienna.

Medical Association, British, founded in 1832, now has a membership of upwards of 50,000. Its headquarters are in Tavistock Square, London, W.C.1, and there are also a considerable number of home and colonial branches. Its official organ is the *British Medical Journal*. Papers dealing with every dept. of medical science are

read at the ann. meeting of the association, which is held at different cities of the country (1949, Harrogate). Originally it was known as the Prov. Medical and Surgical Association, but since 1856 it has borne its present name. Also publishes *Archives of Disease in Childhood* (quarterly); *Journal of Neurology and Psychopathology* (continued since 1938 as *Journal of Neurology and Psychiatry*); *Abstracts of World Medicine*; *Abstracts of World Surgery*; *Obstetrics and Gynaecology*; and others.

Medical Corps, Royal Army, see MEDICAL SERVICE, ARMY.

Medical Education is special training in one or more branches of medicine, but since medicine itself is founded upon physics and chem., M. E. usually includes at least elementary instruction in these sciences. M. E. has developed very differently in different countries. Amongst the earliest records of definite surgical training are those of Hindus in about the fifth century n.c. The Hindu student practised incisions and punctures in the veins and hollow stems of plants; he bandaged models; and in preparation for operations on cysts and ulcers in the human body, he tapped juicy fruits. The works of Hippocrates and Galen formed the foundation of most education in clinical practice and surgery until after the Renaissance, and some 'Hippocratic principles' are incorporated in modern professional etiquette. Except in anatomy M. E. was mainly didactic until the eighteenth century, partly because of the difficulty in procuring specimens and partly because of the complete acceptance of the Gk. writings. In Edinburgh all anatomical demonstrations were shown on a single body, and operations were practised on dogs. This difficulty led to the estab. of museums of anatomical and pathological specimens. Many Brit. students completed their M. E. at Padua, Montpellier, Leyden, Berlin, or Paris.

In Great Britain Oxford, Cambridge, London, Edinburgh, and Dublin, and all prov. univs. (but not the univ. colleges), have a faculty of medicine. The student must first qualify for entrance to the univ. The medical examinations proper comprise the first M.B. in biology, physics, and chem., taken either externally or after one year's study; the second M.B. in anatomy and physiology after a further two years; the third M.B. in clinical subjects after three years spent in hospital practice. In London M. E. has long been associated with clinic 1 observation and demonstration, b.c. in schools not connected with hospitals the teaching was purely didactic until the need for clinical work was fully recognised, and more facilities were afforded.

Before the latter half of the nineteenth century medical specialists were comparatively few, but with the growth of knowledge it became impossible for the general practitioner to learn how to deal adequately with all types and manifestations of diseases. Consequently some doctors and surgeons have specialised in special branches of medicine and sur-

gery, and, after education in the elements of general medicine, it is necessary for the specialist to undergo a course of training in the particular branch of medicine he wishes to follow. The Cambridge Medical School specialises in the experimental branches and the allied sciences. London affords excellent opportunities for surgery, clinical work, and the study of tropical diseases.

Since 1948 all the medical schools of London Univ. have followed the lead of the prov. univs. in admitting women on equal terms with men; in practice about one-fifth of the students are women.

The cost of a M. E. varies somewhat in the different medical schools. The fees for tuition are in the region of £50 per annum, to which must be added considerable items for examination fees, purchase of books and instruments, and expenses of maintenance. Various scholarships are, however, available.

The two important pubs. named below make various suggestions for the reform of M. E., and should be consulted by those seeking further information; one interesting proposal is a compulsory 'intern year' in a hospital appointment after the third M.B. examination, before the student shall be legally entitled to practise his profession. See *Interdepartmental Committee on Medical Schools* (the *Goodenough Report*), 1944, and *The Training of a Doctor* (Report of the Brit. Med. Association), 1948.

The first college of medicine for women was estab. in Philadelphia (1850), and in 1874 the London School of Medicine was opened, and training given in the Royal Free Hospital for Women.

Medical Jurisprudence, or Forensic Medicine, application of medical science to questions of common law. A large body of scientific facts has been built up, having for its purpose the elucidation of points, as far as medical knowledge can throw any light upon the matter, concerning the civil rights of individuals and the nature, extent, causation, etc., of personal injuries. So important has this legal aspect of medicine become, that M. J. is included as a subject of study in the training course of every medical practitioner. Among the subjects dealt with are evidences of age, personal identity, pregnancy, insanity, paternity, etc., as far as they are likely to have any bearing on the responsibility of an individual or his capacity for certain rights; and evidences of rape, abortion, death by poison, drowning, or hanging, possibility of live-birth in trials for infanticide, the identification of blood-stains, etc. See A. S. Taylor, *Elements of Medical Jurisprudence*, 1838, and *Principles and Practice of Medical Jurisprudence* (new ed.), 1928; S. A. Smith and J. Glaister, *Recent Advances in Forensic Medicine*, 1931; J. Collie, *Fraud in Medico-Legal Jurisprudence*, 1932; and H. T. F. Rhodes, *Forensic Medicine*, 1947. **Medical Practitioner**, individual who practises the art of medicine; a qualified M. P. is one whose name is inscribed on the medical register of the General Medical Council in the United Kingdom. The

General Medical Council was estab. by the Medical Act of 1858 to regulate the conditions under which persons entered the medical profession, and a register was instituted to contain the names of qualified individuals. The amended Act of 1886 defined the general scope of the qualifying examination, and gave the council some measure of control over the corporate bodies licensed to grant diplomas. The general requirements do not vary to a great extent among the diploma-granting bodies of the United Kingdom. Before being enrolled on the 'student's register,' an intending practitioner has to produce one of many specified certificates relating to the subjects of general education. A period of 'study of five years' duration is then entered upon. In the first years of the course the student is examined in physics, chem., and elementary biology. Later on the training becomes more purely professional, and includes anatomy, physiology, *materia medica* and pharmacy, pathology, therapeutics, forensic medicine, psychiatry, radiology, obstetrics and gynaecology, pediatrics, etc., together with medicine and surgery, including clinical instruction in a recognised hospital.

The right of the General Medical Council to strike a practitioner's name off the medical register, either for a criminal conviction or for infamous conduct in any professional respect, is a statutory right, but is not subject to appeal unless the members of the tribunal had no evidence on which to found their decision or have fallen short in 'natural justice.'

Any unregistered person practising as an apothecary (the modern 'apothecary' is a general M. P., by licence of the Apothecaries Company; but in popular usage the term is archaic) is liable to a penalty under the Apothecaries Act, 1815. The use by unregistered persons of any title implying registration, or that they are recognised by law, is made an offence by the Medical Act, 1858. No unregistered person can give a valid certificate required by law, or hold an appointment at a hospital, or in a ship, etc., or practise under the National Health Insurance Acts, or obtain dangerous drugs, or treat venereal disease.

Medical Practitioners in the U.S.A.—There is no federal law regarding the practice of medicine in the U.S.A., this being left to the jurisdiction of each of the self-governing states. State medical boards can insist that a would-be practitioner have a diploma from some recognised medical school. In general any graduate of a medical school anywhere can set up in practice after having established his credentials and, in some cases, having passed certain tests. The standard of the medical schools has been raised through the efforts of the Amer. Medical Association and the local state associations, and now, in most schools, the student must have had an academic education and must attend sessions and lectures for four years before receiving his diploma. Some of the greater medical schools, which are heavily endowed, have done their part in adding to the world's stock

of medical knowledge, while some of the Amer. surgeons are unsurpassed anywhere.

Medical Research is fundamentally concerned with the prevention and cure of disease. To this end it is essential that the symptoms and nature of the disease should be known and experiments made to determine its reaction to various methods of treatment. Consequently the methods of M. R. are observational and experimental. The earliest M. R. must have been very haphazard and mainly experimental, but the anet. civilisations and many savage tribes had herbal remedies for various afflictions, and the Chinese and Babylonians attempted to account for their remedies by formulating theories of disease. These theories were purely speculative, and it was not until the time of Hippocrates that the observational method was systematically employed. Arabian physicians made extensive use of this method, but Hippocrates is usually regarded as its founder. It is essential in clinical practice and leads to correct diagnosis. The experimental method was systematised by Galen, and in his investigation of the nervous system he laid the foundation of experimental physiology.

There are certain aspects of disease which cannot be investigated in the clinic. While the observational method could discover a connection between *Anopheles* and malaria (see MALARIA), experimental work was necessary to trace the life hist. of the malaria parasite and its phases in man and mosquito. Semmelweis (1857), as a result of clinical observations, showed that infection could be spread by living and by dead bodies; Pasteur and Koch, in the laboratory, were able to isolate infective organisms and to investigate their reactions. The development of this pioneer experimental work in bacteriology is seen in the growth of immunotherapy during recent years (see BACTERIA; MEDICINE.)

Experimental M. R. is so wide a field that it deals with subjects included in separate branches of science, such as bacteriology, parasitology, physiology, obstetrics, therapeutics, dietetics, biophysics, biochemistry, anatomy, and surgery. The rapid development of the experimental method during the present century has called forth much adverse criticism. The behaviour of organisms and of tissues in culture may be very different from their behaviour in a patient. The reactions of rats, dogs, and rabbits may be very different from the reactions of human beings. A healthy animal, infected in the laboratory with a disease, may not be affected in the same way as an uncleanly one or as an animal living a normal life. So long, however, as the research worker fully realises these and similar possibilities, they do not vitiate his results, but rather enable him to apply them with greater reserve and in a more critical manner. Obviously the best conduct of M. R. is in the co-ordination of the observational and experimental methods, and some modern research laboratories are in close connection with a hospital in which patients may be observed and, if willing,

subjected to experiment. The experimental method receives severe criticism for its use of animals such as rats and rabbits in the investigation of rickets and cancer; of various vertebrate animals in the study of the endocrine organs in physiology, and other branches of M. R. The choice of the subject of the experiment must always fall either on the human being or on a different animal, and it is doubtful whether there will ever be unanimous agreement on this vexed question. That man has undoubtedly benefited by such experiments is shown by the use of insulin in *Diabetes mellitus*, of liver for pernicious anaemia, the efficacy of the antirachitic vitamin and the determination of its presence in various food substances. Man has also benefited by experiments on his fellows, as in the case of the voluntary infection of Dr. P. T. Manson with the malaria parasite to forward the research on malaria. Opponents of vivisection should bear in mind that without it substantial progress in M. R. at the present day would be impossible. Such experiments in living animals are very carefully regulated by the Home Office.

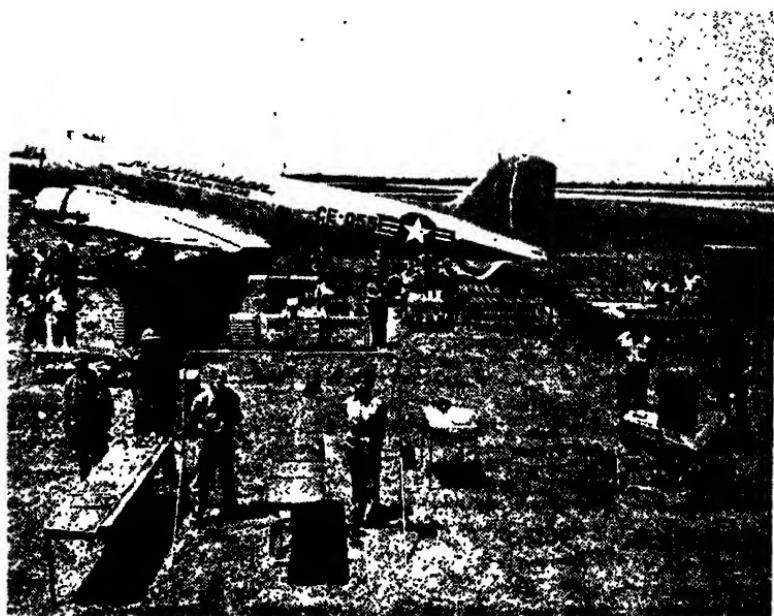
Statistics may be very useful in investigations of epidemiology, heredity, diet, and other subjects of M. R., and non-mathematical research workers on such subjects need to co-operate with skilled statisticians in order to get as complete an interpretation as possible of their results. Recent research on these lines has led to the prediction and probable course of certain epidemics (see EPIDEMIOLOGY). The statistics, however, need to be scientifically collected and to be thoroughly reliable, otherwise they may be totally obstructive instead of leading to progressive research. Much work remains to be done on the best method of obtaining reliable statistics, and the best type of statistics for especial purposes. The research worker, in addition to skilled technique, needs patience, endurance, ability to review his results critically, and readiness to discard preconceived ideas or working hypotheses when there is insufficient experimental evidence to support them. Individuals owe much to advances due to research in biophysics in connection with radio-, actino-, and electro-therapy, electro-cardiography, and improvements in auscultory apparatus. The latest methods employed in obstetrics are due to research in biochemistry, surgery, physiology, and embryology (see articles on these topics). Considerable attention is devoted both to clinical and experimental work on cancer, its treatment and earlier diagnosis. Research is being carried out to determine whether reliable diagnosis of the disease at an early stage may be made by blood tests (see CANCER). See also NUFFIELD COLLEGE. See B. Dawson, *The History of Medicine: A Short Synopsis*, 1927; J. A. Dehnege, *Towards National Health*, 1931; D. Riesman, *Medicine in Modern Society*, 1938; G. F. McCleary, *The March of Medicine*, 1941; G. W. Gray, *The Advancing Front of Medicine*, 1941; and M. Silverman, *Was against Disease*, 1942.

Medical Service, Army. Medical service in the Brit. Army is provided by the Royal Army Medical Corps. Before the Crimean war the service was on no permanent basis, and was carried on in a haphazard manner. There existed expert advisers to the army, officers of high rank, but there was no united corps of officers and other ranks as we know it to-day. In the early campaigns, and through the Peninsular and Waterloo, attention in the way of non-medical comforts was provided by the wives of soldiers, who were permitted to follow their husbands on active service. Gradually regimental hospital staffs were formed, but it was not until the Crimean war that a corps of men only (no officers) was formed 'for the better care of sick and wounded,' entitled Medical Staff Corps. In 1857 it became the Army Hospital Corps. In 1884 the doctors were formed into the Medical Staff, but the final welding of officers and men did not take place until 1898, when the Royal Army Medical Corps was formed. The opening of the Herbert Hospital at Woolwich in 1861 marked an important stage in the development of the A. M. S., and other hospitals followed at Netley, Aldershot, and elsewhere. The estab. of a corps for the medical service advanced the provision of medical units for subsequent expeditions; and the members of such units often distinguished themselves, many winning the Victoria Cross. During the First World War the estab. of the A. M. S. expanded in conformity with army expansion generally and, from an estab. of 9000 other ranks in Aug. 1914, increased to 133,000 in the last year of the war. A total of 9,000,000 casualties was dealt with, 2,000,000 being on the W. front. The R.A.M.C. was, of course, assisted by the Nursing Services, Red Cross, and other similar organisations. A beautiful window in Westminster Abbey perpetuates the memory of countless acts of bravery performed by the A. M. S. The varied fronts on which fighting took place during the First World War was a test of the efficiency and organisation of the A. M. S. Every means of conveyance, modern, obsolete, and improvised, was brought into use, and all sorts of buildings were converted into hospitals. Ingenuity contributed largely to the comfort of the sick and wounded. Protection of casualties from aerial attacks was a new feature of the First World War and, in the shell-fire zone, protection was of paramount importance. The range of modern weapons brought the activities of the A. M. S. well within the danger zone. Shells blew up aid posts and dressing stations or wiped out bearer-parties, and some 6873 members of the A. M. S. were killed and many thousands were wounded. Many Amer. doctors joined the Brit. A. M. S., and were granted officers' commissions in the R.A.M.C. When the Amer. Army came to Europe they were permitted to join the Amer. Army. For a full story of the A. M. S. during the First World War see Maj.-Gen. Sir W. G. Macpherson, *Official History of the Medical Service, 1914-18*; H.M.S.O., *Regulations for Army Medical*

Services, 1932, and Organisation, Strategy, and Tactics of the Army Medical Services in War, 1937.

Army Medical Service in the Second World War.—The A. M. S. made great strides in the Second World War, as exemplified in operations performed in the battle zone. Thus in the N. Africa battle area first aid was administered on the field; then, by way of an advanced dressing station, the wounded man arrived at a casualty clearing station. This was the

From the casualty clearing station the patients were sent to a general hospital at the base, often by motor ambulance to an aerodrome, and thence by ambulance plane, often performing in 2 or 3 hrs. a journey that by any other means would take 36 hrs. General hospitals were all equipped in the same manner as the casualty clearing station, and many of them had special sections for various types of casualties. They had from forty to eighty trained sisters and



'Life' photo by Francis Millar

AIRBORNE HOSPITAL OF THE U.S. ARMY

Equipped with its personnel in one C-47 aircraft, it has ten beds and a laboratory (background), a surgery (foreground); and a dental unit (on the right).

most advanced medical post where operations could be properly performed. A mobile electric unit supplied power for X-ray and lighting. In fact, the casualty clearing station was completely mobile, carrying tentage for operating theatres and wards. Expert surgeons and eminent doctors were employed in these advanced stations. These stations, which in N. Africa were generally about 20-30 m. behind the front lines, were expert at moving, and from positions over 100 m. away could reach their new destination by evening, and be ready to receive patients the following morning. Each station had its team of specialists: physician, surgeon, anaesthetist, X-ray specialists, and dental officer, together with eight sisters, R.A.M.C. nursing orderlies, and cooks,

many R.A.M.C. men for the other tasks necessary in a modern hospital. These hospitals were divided into two main divs., medical and surgical. The treatment of wounds in the Second World War was well in advance of that in the previous war. Plaster fixation and sulphonamide drugs enabled the surgeon at the front to prepare his patients so well that long journeys even by road and rail did no harm. No doubt it would have been ideal if all patients could have been evacuated by air, but that was not possible, though in the Burma theatre it was achieved to a very large extent.

Army Medical Service of the U.S.A.—

The normal or peacetime strength of the medical corps of the U.S. Army is about 6400 officers and men. There are small

hospitals connected with every army garrison, but there are also large general hospitals at Hot Springs, Arkansas, Denver, Colorado, the presidio of San Francisco, a general army medical centre, including Walter Reed Hospital in Washington, D.C., and at El Paso, Texas. In the colonial possession the army has hospitals at Manila in the Philippines (lost to the Jap. in 1942), and at Honolulu in the Hawaiian Is. There is also an aviation hospital at San Antonio, Texas. Here has been developed a complete airborne emergency hospital, carried in one plane. The 100-bed field unit can be carried in nine aircraft.

During the First World War there were, at the front or at the base hospitals, more than 20,000 medical officers, and ten times that number of other ranks. It is estimated that there were something like 20,000 nurses attending a total of over 350,000 beds.

During the Second World War there were at the front or at the base hospitals more than 14,000 medical officers and six times that number of other ranks. It is estimated that there were more than 10,000 nurses attending a total of over 120,000 beds.

Medical Societies. Numerous societies of widely different medical denominations exist throughout the Brit. Isles, more than ninety in England, five in Wales, sixteen in Scotland, and three in Ireland. The Ministry of Health may be accounted one of these, with its gov. lymph estab., and its many pubs. appearing from time to time. The Brit. Medical Association (founded 1832) is the greatest society, with headquarters in Tavistock Square, W.C.1, and its weekly pub. of the *British Medical Journal*; its branches are found throughout Britain and the colonies. The annual meeting is of great interest and value to the medical profession; in 1949 it was held at Harrogate (see MEDICAL ASSOCIATION, BRITISH). The Royal Society of Medicine, 1 Wimpole Street, W.1, has meetings throughout the winter, and publishes its *Proceedings* annually at five guineas; its private library consists of 140,000 vols. The Medical Society of London (founded in 1773), 11 Chandos Street, W.1, meets twice monthly during the winter, with lectures and discussions, and publishes *Transactions* at 15s. The Lister Institute of Preventive Medicine, the Medical Research Council, Research Defence Society, Ophthalmological Society, and Royal Sanitary Institute (to which the Parkes Museum belongs) are representative of the various interests of the societies.

Medici, name of an illustrious Florentine family. Cosimo de' M. (1389-1464), called 'pater patrie' by his grateful fellow citizens, was the son of Giovanni (c. 1360-1429), who is justly regarded as the founder of that greatness which afterwards distinguished his posterity. In 1433 Cosimo was obliged to leave his native Florence and to seek refuge in Venice as the result of one of those sudden revolutions which are inseparably associated with the hist. of the It. medieval

republics. The following year, however, he was recalled, and until his death directed the fortunes of Florence, saving her from the ravages of war by his prudent alliances and skilful foreign policy, and using his enormous riches for the generous and enlightened patronage of art and literature. He instituted an academy for the study of Platonic philosophy, collected a number of priceless classical and oriental MSS., which formed a splendid nucleus to the Laurentian library, gathered about his court some of the foremost painters, sculptors, and scholars of the day, and won



DEATH MASK OF LORENZO THE MAGNIFICENT

golden opinions for his munificence and generous charities. The name M. adorned none more illustrious than Cosimo, unless it was his grandson, Lorenzo the Magnificent (1449-92). Lorenzo also was the victim of the endless family feuds, and narrowly escaped assassination at the hands of the influential and jealous Pazzi. He was perhaps even more lavish in his patronage of learning than his grandfather. The academy which he founded for the study of the antique was largely responsible for the rapid dissemination over Europe of Gk. and Lat. literature, as well as for the pre-eminence of Florence in the field of Renaissance culture. It was he who seized at once on the vital importance of printing, and it was he who procured, through John Lascaris, 200 MSS. from the monastery of Mt. Athos, which were designed to embellish the Laurentian library already referred to. This unique collection, together with the equally unique

collection of ant. sculptures and vases, etc., was broken up and in part destroyed when the Fr. sacked the city, which was under the rule of Piero (1471–1503), the incompetent son of Lorenzo. The astute politician Giulio (1478–1534), who rose to be Clement VII., was an illegitimate son of Giuliano, Lorenzo's ill-fated brother. A second son of Lorenzo, Giovanni (1475–1531), succeeded to the papal chair as Leo X. Lorenzo II. (1492–1519), grandson of Lorenzo the Magnificent, exhibited all the incontinence and infirmity of will which mark a degenerate race, whilst the viciousness of his character was further emphasised in his natural son, Alessandro (1510–37), who governed Florence as duke from 1530, the year of her tragic surrender to the emperor Charles V. Cosimo I. (1519–74), who was created grand-duke of Tuscany in 1570, and Ferdinand I. (1549–1609), were descended from Lorenzo (1395–1440), a younger brother of the great Cosimo. The male line of the M. became extinct with Giovan Gastone (1671–1737), the seventh grand-duke. See CATHERINE DE' MEDICI and MARIE DE' MEDICI for the alliance of this house with the royalty of France. See Janet Ross, *Lives of the Early Medicis*, 1910; C. Booth, *Cosimo I., Duke of Florence*, 1921; G. Maguire, *The Women of the Medici*, 1927; H. Acton, *The Last Medici*, 1931; D. G. Loth, *Lorenzo the Magnificent*, 1930; and C. Stange, *Lorenzo il Magnifico*, 1940.

Medici, Alessandro de', see LEO (popes).
Lev XI.

Medici, Catherine de', see CATHERINE DE' MEDICI.

Medici Chapel, one of the monumental works on which Michelangelo was employed in the years 1520–34, and intended to be the burial-place and monument of the M. in their family church of San Lorenzo, in Florence. It was not built by Michelangelo, but the commission for its decoration and the monuments in it was given to him by the M. popes, Leo X. and Clement VII. For various reasons it was never completed, the execution of the commission being interrupted by the demands of earlier commissions, straitened papal finances, and the conflict between the papacy and the Florentines in which Michelangelo himself was deeply involved as engineer of the fortifications of Florence. The architectural decoration of the chapel, the four allegorical figures of Dawn and Evening, Night and Day, on the two sepulchres, and the seated figures of the dukes Lorenzo and Giuliano above them, are almost complete; but of the still more elaborate double sepulchre on the entrance wall only the group of the Virgin and Child, which was to have occupied the centre, was completed. The whole leaves an overwhelming impression and, although unfinished, it illustrates Michelangelo's power, in his prime, of achieving a unity which resolves discords and conflicts. In his interpretation of the art of Michelangelo, as exemplified in this monument, Dr. Charles de Tolnay sees not merely a sepulchral chamber, in itself a novelty, but also a microcosm of the

universe. See C. de Tolnay, *Michelangelo: the Medici Chapel*, 1949.

Mediol, Giovanni de', see LEO (popes).
Leo X.
Medici, Marie de', see MARIE DE' MEDICI.

Medicina, tn. of Emilia, Italy, in the prov. of Bologna, 15 m. S.E. of the tn. of that name. Pop. 14,000.

Medicinal Herbs. In medieval times few plants were without their supposed medicinal value, but the progress of medicine has limited them to a very small number. With a special state dept.'s aid, considerable attention is devoted to the culture of M. H. in the U.S.A., but in Britain, where in the E. cos. a century ago their culture was an important industry, they are little grown now and considerable importations are received from India and other countries. Some plants, such as foxglove, hemlock, belladonna, peppermint, valerian, and henbane, can be grown in Britain better than elsewhere. Foxglove and hemlock need to have their juice expressed immediately after cutting.

Medicine, science of the treatment of disease; any substance administered with the object of curing a diseased condition. The term is used sometimes to indicate that branch of the healing art which deals with internal administrations as opposed to surgery or operative treatment. In its widest sense, however, M. includes all varieties of curative treatment, as well as discussion of the causation of disease, and kindred subjects. According to modern conceptions, the study of M. involves first of all the study of anatomy, or the structure and form of the body, and physiology, or the study of function. Medical practitioners are called upon to deal with diseased conditions, hence pathology becomes part of the general subject. The treatment of diseased conditions is studied under the name of therapeutics, which, as far as it is concerned with drugs, involves a study of pharmacology. Operative treatment of surgery has several subdivisions of which dentistry is an important example. Several branches of medical practice have been dealt with separately, of which obstetrics, or midwifery, is of overwhelming importance; it is closely allied to gynaecology, or diseases of women. A special aspect of the application of medical knowledge is indicated in the term medical jurisprudence (q.v.).

The development and classification of medical science have proceeded by gradual steps from very early times. Among the more primitive peoples medical practice was an adjunct of the sacerdotal function, and relied more upon the influence of the deity than upon any intrinsic efficacy in the methods adopted. Even the priests of Asclepius, the Gk. god of healing, relied upon purely religious exercises to effect a cure. The medical school of Cnidus was estab. between 700 and 600 B.C., and was mainly concerned with the description of symptoms as symptoms, dissociated from the patient. In this respect it differed from the Coan school, founded later by Hippocrates. The rise of purely rational curative methods is

associated with the name of the Gk. physician Hippocrates (c. 460 B.C.), who was an outstanding member of a profession which had already taken a distinct place in Hellenic life. The great feature of the work of Hippocrates is the recognition of disease as the result of natural causes, and he and his followers bequeathed to the medical world the principles of minute observation of symptoms and the consideration of these in relation to the patient and environment. These principles have grown into the method of clinical M. The general theory of the Hippocratic school postulated four humours in the human body. These were blood, phlegm, yellow bile, and black bile, and an improper proportion of the constituents was understood to be the cause of disease. Careful observation was necessary to diagnose the state of the body with regard to these elementary humours, and patient application of the available means of cure was combined with assiduous observation of their effects. When the victories of Alexander had disseminated Grecian knowledge throughout the known world, a school of physicians sprang up at Alexandria which founded what has been called the empirical school. The members of this school observed effects instead of inquiring after causes, and built up a body of clinical experience which appears to have led to considerable success in practice. Rome produced the school of 'methodics,' which assigned all morbid conditions to the too great constriction or too great relaxation of the pores separating the atoms of the body. The general treatment, therefore, involved increasing or decreasing the amount of constriction to the required extent by the use of drugs and by carefully adjusted dieting. All the medical knowledge of the ancients was co-ordinated and the results recorded by Galen, who lived in Rome in the second century A.D. The study of his works was pursued in the monastic establs. of the Middle Ages, but the search after a universal principle militated against the development of medical knowledge on scientific lines. The revival of learning helped to clear away some of the masses of superstition which had been superposed on the work of Galen. Good trans. were made by Linacre and others, and the study of anatomy, botany, and pharmacology proceeded apace. Scientific method, much as it helped forward the branches of knowledge which were ultimately to cause great developments in medical theory, did not, however, have an immediately great effect on medical practice. Success was more likely to attend the efforts of the empiricists who constantly sprang up, and overlaid with superstition as their theories were, nevertheless their knowledge of drugs and their skill in manipulation served them and their patients far better than somewhat dangerous dogma. In 1628 Wm. Harvey pub. his discovery, of the circulation of the blood, but it was some time before the importance of this phenomenon was adequately recognised. Progress became constant though gradual, until the appreciation of the truths of

biology as demonstrated by Darwin led to the development of theories with far-reaching effects. In Germany Schonlein commenced a new era by his discovery of a parasite as the cause of the skin disease called favus. Bacteriological research led, in the hands of Pasteur and others, to the conceptions of toxins produced in the blood by bacteria and to the anti-toxin evolved as a result of the intoxication.

On the work of Pasteur and his contemporaries, Koch and Klebs, the modern treatment of infectious diseases is based. Pasteur did pioneer work in vaccination and inoculation; Koch worked out the life-list of certain infective organisms, showing their relation to disease. Klebs discovered bacteria causing typhoid fever and diphtheria, and showed that some bacteria could be removed from a medium by filtration. He thus began the important work on filterable and non-filterable viruses. The results obtained by these three pioneers gave a stimulus to research on bacteriology and parasitology, and numerous infective bacteria and other parasites have been described since the middle of the nineteenth century. As a result, most infectious diseases, even those of epidemic character, are comparatively well under control. (See BACTERIA; EPIDEMIOLOGY.)

Pasteur's results helped to direct Lister's quest for a preventive of wound infections, and surgery, general healing, and hospital sanitation were inevitably advanced by the introduction of antiseptics (see LISTER). Tropical M., which became of interest as a result of exploration and colonisation, benefited by the impetus given to the study of bacteriology and parasitology. The first organised attempt to study tropical M. was made in 1764 by the Indian Medical Service of the Brit. Army. Sir Patrick Manson started the school of tropical M. in Hong Kong, 1866, and the London school in 1898. Subsequently similar schools have been opened in many busy ports, and much has been done to prevent, alleviate, and cure diseases caused by bacteria and by plants and animals parasitic on human beings in tropical countries.

During the nineteenth century considerable progress was made in public hygiene, particularly in connection with water supplies, sanitation, and the improvement of conditions in factories (see HYGIENE). The introduction by Ehrlich of salvarsan in 1910 for the treatment of syphilis paved the way for the discovery of protosol, which was followed in turn by the manuf. of still more efficient bactericides such as sulphanilamide and sulphapyridine; these have proved of great value in the treatment of pneumonia, puerperal fever, gonorrhœa, and other diseases. The discovery of penicillin by Fleming in 1928, and its use on a large scale during and subsequent to the Second World War, are described in the article PENICILLIN. Streptomycin is helping in the battle against tuberculosis, and other antibacterial extracts from fungi, as for instance chloramycetin and aureomycin, are also being investigated. The First

World War stimulated research in most branches of M. New methods of surgery were necessitated by the large numbers of cases needing immediate attention, and quick methods of blood transfusion were introduced (see BLOOD TRANSFUSION). Important advances were made in physiotherapy, leading to the more extensive use of massage, diathermy, electrotherapy, and radiotherapy (see sections on these subjects). Inoculation against influenza, cholera, typhoid, and para-typhoid fevers and other infectious and epidemic diseases was in general use in the army, and military hygiene was vastly improved. New antisepsis were introduced, and special investigations were made of diseases such as trench fever, gas gangrene, and shell shock, peculiar to warfare. Psychological methods of treatment became increasingly used by doctors, and the field of psychology has widened considerably. Shortage of food supplies led to extensive research on diet and nutrition, and this research was helped to a great extent by the discovery of Sir Frederick Gowland Hopkins, in 1906, that in addition to protein, carbohydrates, and fat, 'accessory food factors' are necessary for the maintenance of life. This led to the discovery of the vitamins (see HOPKINS, SIR F. GOWLAND; VITAMINS). The Second World War led, amongst other improvements in M., to the large-scale production and use of penicillin (q.v.) as an anti-bacterial agent. Other noteworthy advances during the twentieth century are mainly of social importance, and tend by preventive measures to raise the national standard of health. The institution of medical inspection of school children, the estab. of dental clinics, of welfare centres, where advice may be obtained relating to pre-and post-natal care of the child, have done much to improve the health of school children, and to reduce infant mortality. The mortality of mothers during child-birth has also been reduced by improvements in obstetric surgery, and Krouse and Gauss (1916) introduced the administration of morphine-scopolamine as an anaesthetic to induce 'twilight sleep' (see OBSTETRICS).

Arising out of the estab. by Mendel of heredity as a quantitative science, various methods of improving the race have been suggested (see EUGENICS; HEREDITY; MENDEL), while M. is also concerned with methods of contraception and their effect on the individual.

Endocrinology has developed into a specialised branch of M., a branch tending to connect it more closely with bio-chem. The effects of abnormal functioning of the ductless glands are seen in *Diabetes mellitus*, associated with the failure of the pancreas to secrete insulin; cretinism and Graves' disease, associated respectively with too little or too much secretion of the thyroid gland; Addison's disease, with the suprarenal bodies, and acromegaly, with the pituitary gland. Much experimental work remains to be done in connection with the endocrine system. Cortisone (compound E), recently extracted from the cortex of the

suprarenal bodies, is now being used in the treatment of rheumatoid arthritis (see BIO-CHEMISTRY).

The modern tendency in M. is to do far more experimental work. Mathematics is frequently employed to help to elucidate the results, and has enabled epidemiologists to predict the course of an epidemic, and hence to be prepared to combat it. The study of heredity and of certain physiological processes is also facilitated by the application of mathematics.

See Sir W. Osler and T. McCrae, *Modern Medicine*, 1925-27; O. W. Betheia, *Clinical Medicine*, 1928; A. J. Brock, *Greek Medicine*, 1929; F. W. Palfrey, *The Facts of Modern Medicine*, 1929; H. L. Tidy, *Synopsis of Medicine*, 1929; E. B. Vedder, *Medicine, its contribution to Civilisation*, 1929; H. E. Sigerist, *Socialised Medicine in the Soviet Union*, 1937; J. Jucquois-Main, *Etude sur la médecine chez les peuples primitifs*, 1938; Sir W. Osler, *Principles and Practice of Medicine*, 1942; G. E. Beaumont and E. C. Dodds, *Recent Advances in Medicine*, 1943; I. H. Pearse and Lucy H. Crocker, *The Peckham Experiment*, 1943; D. Guthrie, *The History of Medicine*, 1945; G. Scott Williamson, *Physician Heal Thyself*, 1945; R. H. Shryock, *The Development of Modern Medicine*, 1948, and *American Medical Research, Past and Present*, 1948; P. Pringle, *Romance of Medical Science*, 1949; Sir J. Conviveare, *Textbook of Medicine*, 1949; and W. R. Feasby, *Medical Manual*, 1949.

Medicine, Forensic, see MEDICAL JURISPRUDENCE.

Medicine Hat ('the town that was born lucky'—Kipling), city of Alberta, Canada, 180 m. E.S.E. of Calgary, with woodworking factories, iron, steel, chemical, and cement works. Important strikes of natural gas have been made in the dist. It is one of the greatest flour-milling centres in the world. Pop. 10,000.

Medicine Man, see WITCH-DOCTOR.

Medicine, Patent, see PATENT MEDICINE.

Medick, the genus *Medicago*, perennial leguminous herb, growing to a height of 2 ft. in England, chiefly on waste land and gravelly or sandy soil, and also found in Europe generally, W. Asiatic countries and N. Africa. Brit. species include *M. sativa* or purple M., and *M. lupulina* or black M. *M. lupulina*, the Hop-trefoil, sometimes called Shamrock and in Norfolk Non-such, is occasionally cultivated with other clovers. It is a trailing biennial with yellow flowers and smooth kidney-shaped pods. *M. sativa*, with blue or violet flowers, and also known as lucerne, is a Mediterranean plant, largely cultivated as a green fodder plant. See also ALFALFA.

Medina, th., 32 m. N.E. of Buffalo in Orleans co., New York, U.S.A., with electric power stations and manuf. of furniture and iron goods. Pop. 5800.

Medina, or Madina (Arabic for 'city'), or Medina Rasul Allah ('city of the apostle of God'), sacred city of Hejaz, 253 m. N. of Mecca in W. Arabia. Besides the fort and the tn. proper, which is fenced with a rampart of massive stone masonry, there are suburbs, where the peasants mostly dwell.

The inhab. are agriculturists, who profit by the natural fertility of the volcanic soil and grow dates, peaches, apricots, and grapes. Next to Mecca M. is the most sacred resort of the Muslim pilgrims, for its spacious and impressive mosque containing the tomb of the prophet. The Héjaz railway reaches to M., though in 1925 the S. branch was destroyed during the Wahabi siege of M. Hist. and gossip (says the distinguished authority, St. John Philby) have long since combined to create in the mind of the traveller expectations of splendour which are doomed to disappointment and he is not prepared 'either for the charm of Madina or for its insignificance.' The approach over the sombre barrier of the lava field dividing the city area from the 'Aqiq valley is uninspiring and only the mosque and tomb of the prophet of Islam, with its dull-green dome and shapely minarets, 'suggests anything else save the bare bones of a departed glory.' 'The rest, at first sight, seems but ruin: the great oasis but a straggling belt of palms of considerable length but little density or grandeur; the city walls broken or disfigured by additions and reparations; and the city itself as an out-worn garment far too large for the body within.' 'A closer acquaintance would disclose unsuspected charms without anything that may be called beautiful except the mosque itself' (H. St. J. B. Philby, *A Pilgrim in Arabia*, 1942). M. comprises the city, the camp, and annexes. All this area is surrounded by an outer wall, forming a rough oval a mile long from E. to W. and half a mile from N. to S. The core of M. is the city, walled all about, and occupying half the E. sector of the enclosed area. Its central feature, close to the E. extremity, is naturally the prophet's mosque, which, though much enlarged in the intervening period, covers the ground actually occupied by Mahomet and his family on their first arrival in A.D. 622. At the S.W. extremity of the annexes, or Anbariya quarter, which is in ruins, is the railway station and workshops. The railway line from this point skirts the W. boundary wall on its northward route. On the S., inside and outside the rather dilapidated wall, are rambling gardens and palm groves, and a small insignificant hamlet called Misr. The main street of M. leads eastwards past a group of mansions on the left forming the residence of the Wahabi governor and his family and suite. The Manakha or camp area is surrounded by the houses and hostels which have grown up to shelter the visitors from the weather. On the other side of the camping place is a broad street called Ainiya, a new commercial thoroughfare leading into the *Haram* area. In the mosque is the famous library of Shaikh al Islam 'Arif Hikmat, the repository of hundreds of rare MSS. Outside the walls of the city there is a deep fringe of palm-groves encircling the old city from the Quba Gate on the S. side to the Damascus Gate on the N. The dates of M. are famous all over the Muslim E. both for their essential qualities and their pious associations. Pop. 30,000. See Sir R. F.

Burton, *Personal Narrative of a Pilgrimage to Al-Medinah and Mecca*, 1855, and E. Rutter, *The Holy Cities of Arabia*, 1928.

Medina del Campo, tn. in the prov. of Leon, 26 m. S.S.W. of Valladolid. There is a fine old castle. Once an important city of over 50,000 inhab., the pop. has dwindled to about 6000.

Medina Sidonia, tn. in the prov. of Cadiz, Spain, 20 m. S.E. of Cadiz. The tn. stands on a hill, and contains the old residence of the dukes of M. S. Pop. 13,000.

Medinet-el-Fayûm, city of Egypt, cap. of Fayûm prov., situated on the Bahr Yusuf. It is an important trade centre of a rich agric. dist. The tn. stands close to the site of the anc. city of Crocodilopolis (Arsinoë), where the Egyptians worshipped the sacred crocodiles kept in Lake Moeris. Hawara, with its labyrinth, is to the S.E. Pop. 43,000.

Meditation. Spiritual teachers of all religions recognise three stages in the soul's progress towards perfection, the purgative, illuminative, and unitive ways. M. is the preliminary and indispensable exercise in the second of these 'ways.' It has been described by Ruysbroek as 'a concentration of all the interior and exterior forces in the unity of the spirit and in the bonds of love' (*L'Ornement des noces spirituelles*, ii. 4), and by Boehme as 'the cessation of individual activity.' It is important to note that M. is not a mere indulgence of a natural disposition to reverie; it involves a deliberate act of attention, a deliberate act whereby all discordant images are expelled from the conscious mind, and all the scattered interests of self are recollected. Hence it is clear that M. must not be confused with mystical contemplation, wherein infused knowledge takes the place of rationation. M. requires the assistance of the imagination, and indeed no less a person than St. Teresa of Avila tells us that she was fourteen years practising M. before she was able to dispense with the use of a book. The most important guide to M. is the *Spiritual Exercises* of St. Ignatius of Loyola, upon which the Society of Jesus founds its whole spiritual teaching. The usual subjects of M. as practised in the Christian Church are the lives and sayings of Christ and the saints, and the cardinal dogmas of faith. This fact immediately distinguishes Christian M. from the *dhyâna* of the Buddhists and *dikhr* of the Sufis, in which is taught concentration upon a single thought, and which may be regarded rather as prolonged acts of mental discipline rather than as stages towards moral perfection. See, besides the works of St. Teresa and St. John of the Cross, S. F. Poulain, *Grades d'oraison*, 1906, and F. von Hügel, *The Mystical Element of Religion*, 1908.

Mediterranean Fever, see MALTA FEVER.

Mediterranean Sea (ancit. *Mare Internum*), great inland sea, bounded on the N. by Europe, on the E. by Asia, and on the S. by Africa, and communicating with the Atlantic by the Strait of Gibraltar, with the Black Sea by the Dardanelles, sea of Marmora, and Bosphorus, and with

the Red Sea by the Suez Canal. It has an area of about 1,008,000 sq. m., including its chief subdivisions, the Tyrrhenian, Ionian, Adriatic, and Aegean Seas, and its extreme length is 2300 m., with a breadth varying from 86 to 600 m. It has a drainage area of about 3,000,000 sq. m., the prin. riva. being the Ebro, Rhone, Po, Arno, Tiber, and Nile. Italy, Sicily, and the shallows of the Adventure Bank, stretching from Sicily to Cape Bon on the African coast, divide the sea into an E. and a W. basin, of which the former has an extreme depth of 2187 fathoms and the latter of 2406 fathoms, while the mean depth of the whole area has been estimated at 780 fathoms. The rivas. bring but a small supply of water compared with the size of the sea, and owing to this and the great amount of evaporation in such a lat. there is a constant inflow from the Atlantic, and the water is saltier than in the great oceans. Its temp., too, at equal depths near the surface is on an average sev. degrees (Fahrenheit) higher than that of the Atlantic. At depths of less than 100 fathoms the water varies in temp. according to season and depth, but at great depths there is an almost constant and uniform temp. of about 55° F. In some places, under particular conditions, the tide rises as much as 5 ft., but taking the sea all over it may be said to be nearly tideless. The climate is warm and equable, the mean daily temp. being above 50° F. for at least eight months in the year, but the M. peninsulas have a marked deficiency of rain, the middle of summer being remarkable for its drought. Among local winds are the *sirocco*, a violent, dry, hot, parching, and dust-laden southerly wind, prevalent chiefly in Malta and Sicily, but occasionally as far N. as Rome; the *lizerche*, a similar wind experienced on the S.E. of Spain; the *solano*, a moist E. wind visiting the same regions; the *mistral* and *bora*, cold, dry, northerly winds, the former of which prevails from the mouth of the Ebro to Genoa, especially round Marseilles, the latter along the coast of Dalmatia; and the *etesian* winds, which blow in the E. parts of the sea, chiefly in late summer and autumn. The prin. is. are Sicily, which divides the M. into an E. and W. portion, Cyprus, Crete, Malta, and the Ionian is. in the E., and Sardinia, Corsica, and the Balearic is. in the W. The most important gulfs are Taranto in Italy, Lepanto in Greece, Syrtis and Cabes in Barbary, in the E. portion; and Valencia in Spain, Lyons in France, Genoa in Italy, and Tunis in Africa, in the W. The M. is frequently subject to earthquakes, and Vesuvius, Stromboli, and Etna are among the most famous of its active volcanoes. The scenery of its shores is varied, mt. ranges and high table-lands predominating. The fauna of the M. is similar in character to that of the neighbouring parts of the Atlantic Ocean, but a marked feature is the scarcity of life in the deeper parts. Fish are abundant, especially tunny, anchovies, pilchards, and mackerel, and the finest coral, sponge, and ambergris are procured. Since the opening of the Suez

Canal, the pearl oyster and various other molluscs have come in from the Red Sea.

The M. is 'the Great Sea of the Hebs.' but the Phoenicians were the first great agents in promoting the communion of peoples, and their flag waved in every part of the waters of the 'Internal Sea.' After them came the Gks., who did much for trade, and even when Carthage had been destroyed and the Romans were all powerful, they still possessed the largest share of the commerce of the M., for the Romans despised all trade. In the Middle Ages the Venetians monopolised its commerce.

From the eighteenth century Great Britain exercised the main influence by the possession of Gibraltar and Malta, an influence which was contested by Italy during the Italo-Ethiopian war (1935-36). During the Sp. civil war tension in the M. became acute when the Sp. insurgents claimed the right to blockade Sp. ports. In the Second World War Great Britain and France controlled the M. up to the summer of 1940; but the whole position was changed by the collapse of France and the entry of Italy on the side of Germany. The position would have been still further compromised by the Vichy Gov., but for the prompt action of Mr. Churchill in securing the immobilisation of the Fr. fleet at Alexandria and the destruction of other units at Oran (July 1940). The balance of power in the M. swung in favour of Britain with the victory of Taranto when half the It. battle fleet was torpedoed by Brit. aircraft (Nov. 1940). This action confined the It. fleet to harbour besides virtually severing contact between Italy and Libya, and the complete opening of the M. to Brit. convoys to Libya seemed to be in sight at the end of the year. But early in 1941 the arrival of Ger. air squadrons in the airfields of Sicily destroyed this prospect, besides endangering Brit. naval operations, though these were by no means stopped, as was shown by the bombardment of Genoa and the naval victory off Cape Matapan (q.v.) (March 1941). But with the combined Ger. and It. air bombardments of Malta and the check on Brit. military operations in Egypt and Libya, Britain for a time lost the command of the M., and her supply ships had to make the 12,000-m. route round the Cape. The turning-point came with the victory of El Alamein (Oct. 1942), the landing of Amer. and Brit. forces in N. Africa (Nov. 1942), and the allied capture of Bizerta and Tunis for these events, besides liberating Malta, foreshadowed the immediate invasion of Italy. After the war other factors entered into the adjustment of the balance of power: Russia at one time sought to secure a voice in Tripoli, but so far this demand has not been followed up; again the question of the continuance or otherwise of the Brit. mandate in Palestine and the future relations of Britain with Egypt, which came before the United Nations in the autumn of 1947, might have seemed to suggest a reorientation of Brit. policy; but these and similar factors, such as Amer. influence in Greece in support of Brit. policy in that country against the Communist attempts to secure control, are

at present imponderables. *See also NAVAL OPERATIONS IN SECOND WORLD WAR; AFRICA, NORTH, CAMPAIGNS IN (SECOND WORLD WAR).* *See E. C. Semple, Geography of the Mediterranean Regions, 1931; E. Muspratt, Greek Seas, 1933; J. Holland Rose, The Mediterranean in the Ancient World, 1934; C. A. Petrie, Lords of the Inland Sea, 1937; F. Saxl and R. Wittkower, British Art and the Mediterranean, 1948; A. Siegfried, The Mediterranean, 1948; and B. Newman, Mediterranean Background, 1949.*

Mediumship, *see PSYCHICAL RESEARCH.*

Medjidie, name of an Ottoman order, instituted in 1852 by the Sultan Abd-ul-Medjid, as a recognition of both civil and military distinction. It is a silver sun with the crescent and star interspersed between its rays.

Medlar, fruit of the M.-tree (*Mespilus germanica*). It is about 1 in. in diameter and hard fleshed when fit to gather, but after storing for a few weeks the flesh softens or blets. The flavour is peculiar, but is relished by many. The tree is much branched and of dwarf habit, and is usually planted for its large white flowers and generally decorative appearance.

Medmenham, vil. of Buckinghamshire, England, 3 m. S.W. of Marlow, famous for its abbey, wh^{ch} was founded by Cistercian monks in the beginning of the thirteenth century. Lord le Despenser founded a nunnery of Franciscans here in 1755, commonly known as the 'Hell Fire Club' (*see also DASHWOOD, SIR FRANCIS*). The vil. is prettily situated near the banks of the Thames. Pop. 500.

Médoc, dist. of France, bounded on one side by the Gironde; famous for its claret, red Bordeaux, Maryaux, Pauillac, and other wines.

Medomsley, tn. in the co. of Durham, England, situated about 1 m. E.S.E. of Ebchester. It is engaged in coal-mining. Pop. 7000.

Medtner, Nikolai Raslovich (*b.* 1880), Russian composer, *b.* in Moscow. He studied the pianoforte under Safonov at the Moscow Conservatoire, gained there the Rubinstein prize, and toured Europe as a pianist in 1901-2, becoming prof. at the conservatoire for a year on his return, but then retiring to devote himself to composition. After the revolution he taught at a school in Moscow and in 1922 went on another tour in the W., but found himself unable to return. He settled in Paris for a time and later in London. M.'s instrumental music displays a rich harmonic invention, but his many songs, impeccable in taste, are his most important work, demanding the highest skill in singer and pianist. For the text he has relied largely upon Russian and Ger. poets, including Goethe, Heine, Pushkin, and others.

Medulla oblongata, *see BRAIN.*

Medullary Rays, term used in vegetable physiology, referring to radiating cellular bands which connect the pith with the cortex.

Medusa, *see GORGONS.*

Medusæ, *see JELLY-FISH.*

Medway, riv. of England. Its source is

in Sussex, and it flows through Kent to Rochester, from which tn. it forms an estuary, joining the R. Thames at Sheerness. The marshland between the M. and the Thames is known as the Hundred of Hoo. The other tns. on its banks are Tonbridge, Maidstone (to which tn. it is navigable), and Chatham.

Medwig-ston, *see MAIDSTONE.*

Mees, Arthur (1875-1943), Brit. editor and author, *b.* at Stapleford, near Nottingham. In 1906 he produced the *Harmsworth Self-Educator*, and various other works followed, notably *The Children's Encyclopedia*, which he ed. from 1908 to 1933; *The Harmsworth History of the World* (1907); and *The Harmsworth Popular Science* (1912). He also founded and ed. the *Children's Newspaper*. In many productions he was associated with Sir John Hammerton (*q.v.*). He wrote *Joseph Chamberlain* (1900); *Arthur Mees's Golden Year* (1922); *The Children's Shakespeare* (1926); *The Rainbow Books* (1939); and *The King's England*, a survey of Eng. tns. and vills. (from 1936). *See Sir J. Hammerton, Child of Wonder, 1947.*

Meeanees, *see MIANI.*

Meergeren, Han van (*d.* 1917), Dutch artist, *see FORGERY, Forger in Art, or Painting.*

Meenen, *see MENIN.*

Meerane, tn. in Saxony, Germany, situated about 9 m. N. of Zwickau. It is an industrial centre, and manufactures woollen goods and cloths, which it exports. Pop. 24,000.

Meer, Jan van der, name of two Dutch painters of Haarlem, who were father (1628-91) and son (1656-1705). Both painted landscapes with cattle. The father excelled also in sea-pieces and battle scenes, whilst the son, who had studied under Nicolas Berchem, and who was besides a charming etcher, was famous, above all, for his studies of sheep.

Meer, Jan van der (1632-75), *see VERMEER, JAN VAN.*

Meerkat, or Suricate (*Suricata tetradactyla*), mammal, with soft and long grey fur, which is found in Cape Prov., and belonging to the civet family. A third of its length (14 in.) is occupied by the tail. The M. feeds on succulent bulbs, is sociable, and partial to sun baths. The Madagascar cat and the *Cynictis penicillata* are also termed Ms.

Meerschaum, ($\text{Si}_2\text{O}_5(\text{H}_2\text{O})_2\text{Mg}_2\text{H}_2\text{O}$), white or yellowish amorphous mineral, composed of hydrous silicate of magnesia. When dry it floats on water. Hardness, 2 to 2.5. It decomposes in hydrochloric acid with gelatinisation, and gives off water when heated. It occurs in beds and in irregular masses in alluvial deposits at Lamos and Negropont, in Asia Minor, Morocco, and in Spain, where it is used as a building stone. It is used for making pipes and pipe bowls, being admirably adapted by reason of its lightness and porosity. It is first soaked in tallow and in wax, and then polished.

Meerssen, com. of Holland in the prov. of Limburg, 4 m. N.E. of Maastricht. Pop. 6000.

Meerut, cap. of the dist. and div. of M.,

United Provs., India, situated 40 m. N.E. of Delhi. To the N. of the city is a cantonment, and it is the site of a military station. M. was the place at which the Indian Mutiny first broke out in 1857. Pop. (1941) 169,300; (div.) 6,700,000; (dist.) 1,896,000.

Megæra, see under EUMENIDES.

Megalith Culture (Gk. μεγάς, great; λ. *meus*, stone) is named from a development of Neolithic times characterised by the building of menhirs, alignments, tombs, and standing circles of large stones. Since the middle of the nineteenth century the term M. has come to mean either a large stone used in the construction or the construction itself as a whole. The M. tomb was essentially derived from the rock-cut tombs of the W. region of the Mediterranean, and the fashion spread along the Atlantic seaboard of Europe, through Spain, France, and the Low Countries as far W. as the Baltic. The Ms. postulate a most powerful religious practice based on the ritual significance of fertility and directed to the worship of the earth mother. M. C. included mixed farming, rearing of stock, and the development of potting and weaving of cloth. When it impinged upon the older food-gathering civilisations, its economic effects were profound and indeed little short of revolutionary. In this the axe of polished stone played an important part. There are sev. varieties and many notable examples of Ms. in Britain, and recent controlled excavations in the Orkneys, Caithness, the Cotswolds, Wales, and at Avebury and Stonehenge have added much to our knowledge of the M. C. The dolmen, a roofed burial chamber of stones, is found in the W. regions of England, in Scotland, and in Wales, but many are merely the chambers of long barrows from which the earth or stone envelope has been denuded; Kit's Coty in Kent and the Devil's Den near Marlborough are well-known examples. The long barrows vary in their architectural features; the chambers in the last stages were inserted in the side of the mound and the site of the former functional entrance occupied by a ritual false doorway. Well-known examples in Great Britain are Belas Knap and Rodmarton, Gloucestershire; Wayland's Smithy, Berkshire; and Carn Barn, Arran, and there are many others. Some of the standing-stone circles are later than the Neolithic period. Of the circles Stonehenge, Avebury, and Arbor Low, Derbyshire, are notable examples. See O. G. S. Crawford, *The Long Barrows of the Cotswolds*, 1925; M. C. Burkitt, *Our Early Ancestors* (ed. 1929); and J. and C. Hawkes, *Prehistoric Britain*, 1943. Maps: Ordnance Survey Megalithic Survey, *Neolithic Wessex, The Trent Basin, and South Wales*.

Megalopolis, most recent but the most important of the cities of Arcadia, was founded on the advice of Epaminondas after the battle of Leuctra (371 B.C.), and was formed out of the inhab. of thirty-eight vils. It was situated in the dist. Mænalia, near the frontiers of Messenia, on the R. Helisson, which flowed through

the city. It became afterwards one of the chief cities of the Achæan league. Philopomen and the historian Polybius were natives of M.

Megalosaurus, extinct reptile, a sub-order of the dinosaurs. Fossil remains, chiefly fragmentary, occur in Jurassic and cretaceous deposits in Europe, Asia, and N. America. It was a large carnivorous reptile, from 15 to 20 ft. long, with formidable teeth, powerful hinder quarters, and a long thick tail.

Megaphone (from Gk. μέγας, great, and φωνή, sound), instrument invented by Edison, for facilitating the conveyance of sound for a distance of some miles. It consists of two large und tapering funnels.

Megapodidae, see MOUND BIRDS.

Megara, cap. of Megaris (q.v.), a small dist. in Greece, between the Corinthian and Saronic Gulfs. In ancient times M. formed one of the four divs. of Attica; but it was conquered by the Dorians, and was for a time subject to Corinth. It finally asserted its independence and rapidly became a wealthy and powerful city. After the Persian wars M. was for some time at war with Corinth, and was thus led to form an alliance with Athens, and to receive an Athenian garrison into the city (461); but the oligarchical party having got the upper hand, the Athenians were expelled (441). M. is celebrated in the hist. of philosophy as the seat of a philosophical school, usually called the Megarian, which was founded (about 400 B.C.) by Euclid, a native of the city. It was known for its white shell marble and for a white clay, of which pottery was made. See E. L. Hightower, *The History and Civilization of Ancient Megara*, 1927.

Megaris, small mountainous region of Hellas, or Greece Proper, bounded by Attica, Corinth, and the sea. It formed the N.E. part of the isthmus of Corinth. Cap. Megara (q.v.).

Megasthenes, Gk. writer who lived in the third century B.C. He was sent by Seleucus Nicator as ambas. to the Indian King Sandrocottus, and spent some time at his court in Magadha in the valley of the Ganges. While he held that position he compiled an historical and geographical work about India, entitled *τὰ Ἰνδία*. This book, which is written in the Attic dialect, is the chief treatise on that subject left us by the ancients, and on it are incorporated the records of both Diodorus and Arrian.

Megatherium (Gk. 'great beast'), gigantic extinct herbivorous quadruped (18 ft. long, 8 ft. high), of the order Edentata, and with Mylodon, Megalonyx, etc., forming the family Megatheriidae. It was a kind of giant sloth. Its skeleton was found in the Argentine in 1789. In the S. Amer. pampas deposits of the Pleistocene period. The structure of the lower jaw indicates that it had a prehensile tongue similar to that of the giraffe.

Megerie, Ulrich, see ABRAHAM A SANCTA CLARA.

Meghna, estuary of the Ganges and the Brahmaputra, enters the sea by four mouths. Navigation is somewhat impeded by a strong tidal bore.

Megiddo (modern Tell el-Mutesellim), old

fortified city of Palestine, commanding the best pass from the Mediterranean to the valley of Esdrælon and on N. to Galilee and Damascus. It was always a point of great strategic importance; the great Pharaoh Thothmes III. (middle fifteenth century B.C.) defeated here the Canaanites, and the Judaean King Josiah (2 Kings, xxiii. 29 f.) was defeated and mortally wounded by Necho (609 B.C.); finally, in 1918, Allenby defeated here a Turkish Army.

A Ger. expedition excavated this site in 1903-5, but it found little of exceptional interest. Large-scale systematic excavations, however, of the Oriental Institute of the univ. of Chicago (1925-39), with

with hydraulic lime-plaster. Each unit of stabling consisted of a central passage (c. 10 ft. wide), flanked by two rows of stone pillars, which served simultaneously as tie-posts and as supporters for the roof. Beyond were two aisles for the horses (each 10 ft. wide), each unit accommodating over thirty horses. See J. Finegan, *Light from the Ancient Past* (3rd ed.), 1947; F. Thieberger, *King Solomon*, 1947; and W. F. Albright, *The Archaeology of Palestine*, 1949.

Megrin, see MIGRAINE.

Megrims, temporary loss of voluntary power and movement in horses. The symptoms frequently occur when a horse is going up-hill with a stiff load and tight



E.N.A.

MEGIDDO: THE EXCAVATION OF SOLOMON'S

resources which dwarfed all preceding excavations (nearly \$1,000,000 was spent) produced extremely interesting results. The debris of occupation reaches about 70 ft. of depth, the lowest level of occupation going back to the beginning of the fourth millennium B.C. or earlier. The most interesting results so far are the extensive stables (discovered in 1928) of the Israelite kings, which were first built in the time of Solomon (970-931 B.C.), and the astonishing hoard (found in 1937) of more than 200 carved and incised ivories from the twelfth century B.C. The M. stables covered a considerable portion of the site, and, according to the easily recognisable lay-out, provided room for 450 to 480 horses and 150 to 160 chariots. The stables were exceedingly well built; the architects who reconstructed a model of the stables on the basis of the remaining ruins, were struck by the aesthetic and practical nature of the design. The stables and the adjacent courtyard were paved

collar, following congestion of the blood vessels in the brain; the horse falls down and its pulse is very small. General attention to the animal's condition, the provision of a more comfortable collar, and less heavy loads check its recurrence.

Mehadia, mukr. tn. of Banat, Rumania, 15 m. N. of Orsova. It was on this site that the Rom. tn. of Ad Medium was built, and the Hercules baths known in Rom. times are near here. Pop. 2500.

Mehallet-el-Kebir (ancet. Cynopolis), cap. of the prov. of Gharbiye, lower Egypt, situated 45 m. S.W. of Damietta. Pop. 48,000.

Mehemet Ali, or Mohammed (1769-1849), pasha of Egypt, b. at Cavalla, Rumelia, where he at first kept a shop, but soon gave up trading for the profession of arms. He helped to suppress a rebellion in Crete. Later, in Egypt, at the head of a corps of Albanians, he co-operated with the Brit. in driving out the Fr. from that country, and afterwards, having made an

alliance with the Mamelukes against the Turkish sultan's regent, Khosrow, became viceroy of the Mamelukes. Mainly through bribery he was made pasha of Cairo by the sultan in 1806, and then, turning against his former allies, the Mamelukes, tried to exterminate them, and did indeed cause large numbers of them to be assassinated, thereby securing undisputed sway over upper Egypt. He now sought to suppress the fanatic Wahabis in a war which lasted for seven years, during which his son, Ismail Pasha, conquered Dongola, Kordofan, Sennar, and other provinces. Another son, Ibrahim, he sent in command of a large fleet to Morea to co-operate with the Turks against the Greeks, in their struggle for independence; but his fleet was completely destroyed at Navarino (q.v.) (1827). The sultan, however, in return for his aid against the Greeks, surrendered Crete to M. in 1830, and was promptly met with a demand for the cession of Syria. This having been rejected, M. invaded and conquered that province, and, after inflicting a crushing defeat on the Turks at the battle of Konieh, marched on Constantinople, but was baffled by the intervention of the European powers. He succeeded, however, in acquiring Syria and Adana under a treaty signed at Kutahia. In 1839 the Sultan Mahmoud II. sought to regain Syria, but, being heavily defeated by M., appealed to the European powers for assistance. The outcome of European aid was that M. was defeated near Beirut, and, Alexandria being blockaded, M. gave up further claim on Syria, but secured for his family recognition as hereditary pashas of Egypt. In 1848 he resigned in favour of his son Ibrahim, who was soon afterwards succeeded by Abbas, M.'s grandson. In the closing years of his life M. lost his reason. M. was unquestionably a great soldier, and a most able ruler, albeit owing much to intrigue and assassination. He not only succeeded in organising his army on European models, but in peace gave a great impetus to agriculture and commerce, besides founding medical and military schools, reforms the more remarkable in view of his lack of education. See H. Dodwell, *The Founder of Modern Egypt: A Study of Muhammad Ali*, 1931.

Mehlis, see ZELLA-MEHLIS.

Mehoffer, Józef (b. 1869), Polish painter, b. at Ropczyce. His stained-glass work, especially that at Freiburg in Switzerland, is noted for its fresh and lively colouring, and he has had much influence on the revival of the art. See J. Berthier, *Les Vitraux de Mehoffer à Fribourg*, 1918.

Mehomia, or Razlog, Bulgarian tn. of Macedonia, situated 55 m. S.E. of Sofia. Pop. 8000.

Mehta, Sir Firozshah Mehrvâñji (1845-1915), leader of the moderate Congress party in W. India; b. at Bombay, son of a Parsi merchant. He was the first Indian to be called to the Eng. Bar (Lincoln's Inn, 1868). From 1872 he sat on the Bombay corporation. A member of the supreme legislature for three triennial terms, he was one of the founders of the National Congress, becoming its president in 1890. K.C.I.E., 1904.

Méhul, Étienne Henri (1763-1817), Fr. composer, b. at Givet, Ardennes, and studied musical composition under Gluck. The production of his first opera, *Cora*, was delayed, but meanwhile he made a sensation with his comic opera, *Euphrasine et Coradin* (1790). The *Cora* met with no success, but M. soon reached the front rank with his *Stratonice*. He will be best remembered for his sacred opera *Joseph in Egypt* (1807). His other operas include *Adrien, Phrosine et Melidore*, and *L'Irat*, and he also composed numerous symphonies. He died of consumption, leaving a great deal of musical scores behind him, much of it notable for its dramatic power and effective orchestration. See life by R. Brancour, 1912.

Mehun, tn. in the dept. of Cher, France, situated on the Meuse, 8 m. N.W. of Bourges. Pop. 5100.

Meiderich, Ger. tn. incorporated with Duisburg (q.v.).

Meier-Graefe, Julius (1867-1935), Ger. art historian, b. at Reschitzka, Rumania. He wrote on the development of modern art and studies of Cézanne (1910), Van Gogh (1910); Delacroix (1913); Courbet (1921); Dostoevsky (1926); Renoir (1929); and Corot (1930). He was editor of *L'art décoratif* from 1898 to 1900.

Meighen, Arthur (b. 1874), Canadian Conservative statesman, b. at Anderson Post Office, Perth co., Ontario, son of Joseph M. Educated at St. Mary's Collegiate Institute and Toronto Univ., he taught in a school and later engaged in business. Called to the Bar in 1903, he practised at Portage la Prairie, for which place he was first elected to the House of Commons, 1908. Solicitor-general 1913; secretary of state and afterwards minister of interior 1917; he attended the imperial conference of 1918. He was Prime Minister and privy councillor in 1920. His party was defeated in 1921, and he lost his seat, but was elected for Grenville co. in 1922, and re-elected for Portage la Prairie in 1925. Prime Minister in 1926, he became minister without portfolio 1932-35, and leader of the gov. in the Senate 1932-35. Early in 1942 he accepted the leadership of the Conservative party, and demanded conscription for overseas service, a total war effort by Canada, and a national gov. In the by-election in March, however, he was defeated for the S. York div. of Ontario.

Meijo Tenno, see MURAKIHIKO.

Meiktila, div., dist., and tn. of Burma. The div. consists chiefly of a level plain, and large numbers of cattle are reared. The chief products are rice, cotton, millet, and sesamum. The tn. of M. stands on a lake. Area of div. 10,854 sq. m.; of dist. 2183 sq. m. Pop. of div. 1,200,000; of dist. 344,000; of tn. 8000. See also BURMA, SECOND WORLD WAR, CAMPAIGNS IN, *Battle for the Burma Oilfields*.

Meilhan, Gabriel Senac de, see SENAC DE MEILHAN.

Meiningen, tn. of Thuringia, Germany, situated on the r. b. of the Werra, 43 m. N.W. of Coburg. Some of the tn. is old, the Elisabethenburg being one of the buildings of interest. Pop. 22,100.

‘*Mein Kampf*’ (‘My Struggle’), title of a two-vol. work written by Adolf Hitler (q.v.), setting forth his political programme. The first vol. was written in the fortress of Landsberg am Lech, Bavaria, where he was undergoing a term of imprisonment after his abortive *putsch* of 1923. The second vol. was written in the years 1925–27 after he had reconstructed his party.

If European statesmen had accepted a literal interpretation of this very frank self-disclosure the Second World War might have been averted. Expressed concisely Hitler’s thesis in this work is that his countrymen should be prepared to endure any hardship and strain every nerve and muscle to fight a great war. Gers. were told that they were the great Nordic people, that it was their duty to increase their pop., and that, when they had once again, by the sword, become a world power, they must remorselessly seek *Lebensraum* by annexing ter. all round. Crude as is the composition of the work, it reveals a powerful brain, proceeding philosophically and with unquestionable logic. If the Ger. people were disheartened and downhearted from their defeat in 1918, they must be reinvigorated with a new outlook, a new *Weltanschauung* or ‘manner of regarding the *wir*.’ This new spirit or way of looking at life and the purpose of national policy is supplied in the book. It is founded not only on the assumed superiority of the Ger. race, but, also negatively, on contempt for Jews, Socialists, and parl. institutions. Rid Germany of the influences due to each and all of these, and the way was open to the next step, the rearmament of Germany, and the piecemeal absorption or destruction of all the surrounding nations. Hitler had learned much from his adversaries, notably the Viennese Socialists. It was from them that he learned the methods of terrorisation and gangsterism which he himself afterwards adopted and, with ruthless cynicism, brought to perfection. He traded on his acquired knowledge of mass psychology and openly avers that the ‘masses would sooner be dominated than supplicated’ and that, however bare-faced the intimidation practised upon their minds, they would be as little conscious of the outrage upon their human liberty as of the fallacies underlying the whole doctrine (see 181st Ger. ed., p. 44). An essential part of the technique in these methods was that of a barrage of lies and calumnies levelled at any selected adversary, e.g. Dr. Schuschnigg of Austria and Dr. Benes of Czechoslovakia. Actually these doctrines of racial superiority and the need for *Lebensraum* were not invented by Hitler. They were essentially personal or local fanaticisms, particularly the anti-Semitic teaching, converted into mainsprings in the pursuit of power-politics.

Such teaching was bound to prevail among Gers. in a way which would be impossible with the democracies, because, in the latter, it is the nation or political unit that supplies the unifying bond, whereas the Gers. have only with difficulty

thought of themselves in any other way than as a race. And this racial pride further explains why the post-war settlement of Versailles, especially on the E. border of Germany, so bitterly rankled in Ger. minds as an unmerited violation of their natural rights. These doctrines supplying the ground plan of his thesis, it remains to ask how Gers. were to become a world power needing a large ter. The answer is the simple one: the sword must win what the plough must till. Not only of the treaty limitations on her arms and armed forces, but of every restraining bond forged by the Versailles Treaty, Germany must as soon as possible ruthlessly rid herself. The actual sequence in the steps taken by Hitler subsequently, re-armament, remilitarisation of the Rhine-land, annexation of Austria, subjugation of Czechoslovakia, and conquest of Poland, conformed to a rigidly logical development. Sooner or later must come the decisive war, and he was ready to embark on it in Sept. 1938, when he compassed the humiliation of Czechoslovakia. The catastrophe of a European war was averted by the Munich ‘appeasement’ fiasco of that year; but the curious thing is that any European statesman could have believed that the absorption of the betrayed Czechoslovak nation could have satisfied Hitler. The legitimate inference is that if they had read *M. K.*, they regarded it as no more than the vapouring of a madman. Yet repeatedly in the thesis recur exhortations to annex ter. as the foremost task of a foreign policy and the first duty of the Ger. National Socialist party. Annexations are described as a moral duty for those who need to expand, and no argument must be heeded which assumes that annexation involves an infringement of human rights. This brief survey of *M. K.* may be concluded with a reference to Hitler’s doctrine that the more any one yields to you the more you should exact from him, and in this connection we may quote the familiar passage on domination: ‘A clever conqueror will always, if possible, impose his demands on the conquered by instalments. For a people that makes a voluntary surrender saps its own character, and with such a people you can calculate that none of these oppressions in detail will supply quite enough reason for it to resort once more to arms.’

Meissen, Heinrich von, see HEINRICH.

Meissen, tn. of Saxony, Germany, on the l.b. of the Elbe, 14 m. W.N.W. of Dresden, built partly on two heights, the Atraberg and the Schlossberg. The latter is crowned by a thirteenth-century cathedral and the Albrechtsburg, where Dresden china was manufactured from 1710 to 1863, after Böttger discovered the art of making porcelain known in Fr. as ‘Vieux Saxe.’ The porcelain factory is now in the Triebisch valley. The tn. is also noted for manufs. of machinery, turbines, and cables, and has textile factories and breweries. M. was founded about 928 by Henry the Fowler, and till the thirteenth century was the seat of margraves, becoming merged in the kingdom of Saxony

about 1423. Cölln-an-der-Elbe was incorporated with M. in 1901. Pop. 47,800. See O. E. Schmidt, *Das tausendjährige Meissen*, 1928; H. Giesau, *Die Meissener Bildwerke*, 1936; and H. Kuas, *Der Dom zu Meissen*, 1939.

Meissonier, Jean Louis Ernest (1815-91), Fr. painter, b. at Lyons, was a pupil of J. Potier and L. Cogniet at Paris. His most characteristic work depicts civil and military life of the seventeenth and eighteenth centuries, or scenes of 'society' life, painted on small panels, and remarkable for finish and detail. The influence of the Flem. figure-painters is evident in these. M. was elected to the Académie (1861), and was president of the Great National Exhibition (1883). Among his works may be mentioned: 'Les Joueurs d'échecs' (1836); 'La Rixe' (1854); 'Cuirassiers of 1805' (1871); 'La Lecture chez Diderot' (1859); 'A Game of Piquet' (1845); 'Arrival of the Guests.' The Wallace Collection (Hertford House, London) has good examples of his 'miniatures in oils,' including 'Soldiers Gambling' and 'A Charge of Cavalry.' See works by J. Claretie, 1881; J. Mollett, 1882; J. Laurens, 1892; G. Larroumet, 1893; M. O. Greard, 1897; and E. Fromentin, 1901; also A. Alexandre, *Histoire de la peinture militaire en France*, 1891.

Meistersingers (master-singers), name given to the Ger. lyric poets of the fourteenth, fifteenth, and sixteenth centuries, who banded themselves into guilds for the revival of the national minstrelsy. Many schools for M. were formed in all parts of Germany, especially the S., perhaps the most famous being that of Nuremberg whilst under Hans Sachs. Each guild was divided into various classes, from beginners or *Schüler* up to *Meisters* or poets, who could invent a new melody in addition to fitting new words to old tunes. Meetings were held weekly in the tn. hall or the church, and there were special competitions and festivals at Easter, Whitsun tide, and Christmas. The members of the guild regarded poetry and music too much in the light of crafts, in which excellence was attained by following certain rules, to produce any very great achievements, but their general effect was good rather than bad. After the sixteenth century the M. gradually died out. Wagner's opera has immortalised their tradition. See W. Nagel, *Studien zur Geschichte des Meistersang*, 1903.

Mejerda River, see BAGRADAS.

Mekenen, Israel von, see MECKENEN.

Mekia, tn. of Algeria, situated 85 m. S.W. of Biskra. Pop. 10,000.

Meklong, seaport of Siam, on the gulf of Siam, 44 m. S.W. of Bangkok. Salt is exported. Pop. 16,000.

Meknès, Mekinez, or Mequinez, tn. of Fr. Morocco, situated 35 m. W. by S. of Fez, on a mt. slope. It is the summer residence of the sultan and the site of the Mulai Ismaïl mosque. Its chief manuf. are earthenware and leather. Pop. 150,800 (Europeans 23,600).

Mekong, Mekhong, or Cambodia, River, chief riv. of the Siam Peninsula, Indo-China, about 2800 m. long. Its exact

source is unknown, but it rises in Tibet, where it is known as the Lan-tsang-kiang, its head stream probably being the Chiam-docher, parallel to the upper Yangtse-kiang. It flows through the Chinese prov. of Yunnan, the Shan country, Laos, and Cambodia, entering the China Sea by numerous mouths in Cochinchina. It forms a boundary between Siam and Indo-China. There are rapids below Chienhong and at Kratie and other parts. The branch from the Tonle Sap (Great Lake, Bienhoa) joins the main riv. at Phnompenh.

Mela, Pomponius, Rom. writer on geography, b. at Tingitana in Spain, probably contemporary with the Emperor Claudius. M.'s work is entitled *De Situ Orbis*. It is divided into three books, and contains a very brief description of the various parts of the world. The best eds. of M. are by Gronovius (Leyden, 1685, frequently reprinted; by Tschucke, 1807; and by Bipont, 1809). M. has been trans. into Eng. by A. Golding, 1585 and 1590, and by U. von Philipp, 1912; into It. by Porcavichi, 1557; and into Fr. by Fradin, 1804. See D. Detlefsen, *Quellen und Forschungen zur alten Geschichte und Geographie*, 1908.

Méla, see MALACCA.

Melampus (Μελάμπος), legendary son of Anythoön and brother of Bias. He is said to have estab. the worship of Dionysus in Greece, and to have been the first to practise the medical art. He was also regarded by the ancients as being the first mortal endowed with prophetic powers.

Melancholia, form of insanity (q.v.). The patient becomes morbidly introspective and suffers from insane delusions, and becomes suicidal. Recovery from M. can be more complete than from any other form of insanity. Fresh air, good diet, and careful exercise and attention to the bodily functions are essential features in the treatment. A condition in which depression and excitement occur, alternately or otherwise, is called manic-depressive psychosis. See S. Freud, *Mourning and Melancholia*, in vol. iv. of *Collected Papers*, 1921-25.

Melanchthon, Philip (1497-1560). Luther's fellow worker in the Reformation, b. at Bretten, Baden. His name was originally Schwarzerd. It was because the celebrated Gk. scholar, John Reuchlin, a relation, had trans. his own Teutonic surname into the Gk. formation Capnio, on the supposition of its connection with *Rauch* (smoko), that the young Schwarzerd (a compound, meaning in Eng. 'black earth') received the more melodious Grecised appellation of M., by which alone he is now known. He was educated at Heidelberg. In 1512 he went to Tübingen, where he became student and teacher, till on his relative Reuchlin's recommendation he was appointed prof. of Gk. at Wittemberg (1518), and it was here he became acquainted with Luther.

In 1521 he pub. his *Loca communes rerum theologicarum*, the first great Protestant work on dogmatic theology, which passed through fifty eds. during his life. In 1530 he made a most important con-

tribution to the cause of Protestantism in the Augsburg Confession (q.v.). His consent, conditionally given, to the introduction of the Augsburg Interim (q.v.) (c. 1547) led to painful controversies. He died at Wittenberg, leaving two sons and two daughters by his wife, the daughter of a burgomaster of that tn., whom he had married in 1520. Among his most notable works are *Sunna doctrinæ Lutheri* (1524); *Libellus visitatorius* (1527); and *Examen ordinendorum* (1552). His numerous works, consisting of theological treatises, commentaries on sev. of the Gk. and Lat. classics, Lat. poems, and some historical and philosophical writings, were pub. in a collected form in 5 vols. at Basle in



PHILIP MELANCHTHON

After an engraving by Albrecht Durer, 1526.

1511, and in 4 vols. at Wittenberg in 1564, again in 1580, and again in 1601. The most complete ed. of his works is that by C. G. Bretschneider in his *Corpus reformatorum* (28 vols., 1834-60; supplements ed. by O. Cleinen, 1910 ff.). See also Peucer's ed. of his works (1562-1564). M.'s life was written by his friend Camerarius (q.v.), 1566. See also lives by B. Saunders, 1897; G. Wilson, 1897; G. Ellinger, 1902; and H. Engelland, 1931; also F. Hildebrandt, *Melancthon, Alien or Ally*, 1946.

Melanesia (Gk. μέλας, black, and νῆσος, is., from the colour of the inhab. of the ls.), name given to a large group of ls. of W-central Oceania, between Micronesia (q.v.) in the N. and Polynesia (q.v.) in the S., inhabited mainly by people of Papuan origin. The term M. embraces all the ls. from the Bismarck Archipelago in the N.W. to the Fiji Is. in the S.E., and includes part of New Guinea, Santa Cruz, Banks Is., New Hebrides, D'Entrecasteaux, New Caledonia, Loyalty, and Admiralty Is. The ls. are either of volcanic or coral formation, abounding in reefs and lagoons, with luxuriant vegetation.

The inhab. are treacherous and ferocious, cannibalism is probably still practised, and they are ethnically affiliated to the Papuans of New Guinea. They are short in stature, with frizzy hair and negroid features, denoting the intrusion of a Polynesian element into the aboriginal stock. They tie their hair into small bunches with fibre, causing it to stick out all round the head. Their protruding jaws and thick lips give them a hideous appearance. They speak an anc. form of the Malayo-Polynesian language, and their religion is animism combined with spirit worship. The is. are devoid of the larger carnivora, but rats, opossums, bats, mosquitoes, and reptiles abound. As M. stretches from 145° E. and 1° S. in a S.E. direction to the Tropic of Capricorn at 180° E., the is. vary in their flora and fauna to a very great extent, as also do their manners and customs. The inhab. of some of the is. are proving amenable to European civilisation, and under good gov. and treatment are showing many signs of improvement.

Anthropologically the different is. groups present many features that would appear to be common to Melanesian society generally, but in some cases there are marked divergencies. In the Banks Is. a noteworthy custom is that of initiation into the *sukue*, a complicated organisation which may be compared to a man's club. A div. of the *sukue* is the *tamate* or ghost societies which meet in the bush. In most vils. in these is. there is a building called the *gamal*, which is the eating and sleeping house of the members of the *sukue* as well as their general meeting-place in the vil. The process of initiation into the various ranks of the *sukue* is an important element in the social life of the Banks islanders. Each of the *tamate* societies is entered by a ceremony of initiation which varies greatly in complexity and duration for the different societies. Most of the *tamate* societies possess objects, worn as hats or as masks, or carried in the hand, and these often bear the shape of the animal or other object from which the society takes its name. The object of the *tamate* is partly disguise, and partly to produce fear among the uninitiated, and to enhance the mystery of the societies. A study of the *sukue* and *tamate* societies is necessary to an understanding of their bearing on the general life of the people of the Banks Is., and especially on the determination of social rank and importance, the distribution of wealth and the protection of property. Though there are many points of similarity between the cultures of the Banks and Torres Is., notably in connection with relationship, the social organisation of the two groups of is. differs considerably. The main social divs. of both groups, however, are exogamous. In the New Hebrides the social structure is that frequently met with in Melanesian is., namely that of the dual exogamous organisation with matrilineal descent. Both sexual communism and communism in property were once practised in M. It is probable that the two kinds of communism were closely associated. Secret

organisations, however, sprang up, which introduced the very widespread custom of taboo, an important feature of which was the protection of individual property.

Perhaps the most instructive is, for Melanesian sociology is New Guinea, the largest of all the M. is. The inhab. of this is. present extraordinary differences in physical characteristics and culture, and the contrast between the relatively tall, dark-skinned, frizzily-haired natives of Torres Strait, the Fly R., and the neighbouring parts of New Guinea on the one hand, and the smaller lighter-coloured peoples of that part of the coast-line stretching from the E. of Cape Possession to the archipelagos of the E. extremity, is so striking that the two peoples must be recognised as racially distinct (Seligmann). Hence the term Papuan is really unsuitable to denote the inhab. of the whole of New Guinea, and it is better to follow Prof. Seligmann, who uses the term 'Papuan' to denote all the inhab. of New Guinea and its archipelagos, and limits the term 'Papuan' to the geographically more W. Papuasians, a congeries of frizzily-haired, and often mop-headed peoples, whose skin colour is some shade of brownish black. The E. Papuan, or the generally smaller, lighter-coloured, frizzily-haired races of the E. peninsula of New Guinea and its archipelagos may be called Papuo-Melanesians (or Massim). Many of these latter speak languages with a common Melanesian grammar. These languages are divisible into groups, the constituent languages of each containing many common words, all akin to the stock language of Oceania. But the vocabulary of the Papuan languages shows a number of evidently unrelated stock languages, and their grammar has no Melanesian characteristics. The inhab. of the N. is. of the Massim, like the inhab. of the Louisiades, are skilled in the craft of building the *waga*, large sea-going canoes, that figure so prominently in the life of the dist. It is in these is. too that the decorative art, characteristic of the whole of the Massim dist., has attained its peak in the carving of ornaments for the bows of the *waga*, and in the decorative patterns of the trobriand lime gourds. The most characteristic cultural feature of the Massim is the existence of a peculiar form of totemism with matrilineal descent. The members of each clan have as totems a series of associated animals belonging to different classes of the organic kingdom. Exogamy is strictly observed. Totem birds, snakes, and fishes are commonly represented upon houses and canoes' bows and upon lime spatule, and indeed on most of the wooden utensils and ornaments of the Massim. For further details of the various groups of is. in M., see the separate articles PAPUA; NEW GUINEA, etc. See R. H. Codrington, *The Melanesians*, 1891; C. G. Seligmann, *The Melanesians of British New Guinea*, 1910; W. H. R. Rivers, *The History of Melanesian Society* (2 vols.), 1914 (a survey of kinship and marriage); and S. H. Ray, *Comparative Studies in the Melanesian Languages*, 1926.

Melanians, family of fresh-water snails, abundant in most tropical and subtropical countries and numbering about 1000 species. The shells are spiral and turreted, and are mostly of dark colours.

Melanorrhœa, genus of tall evergreen trees (order Anacardiaceæ). *M. usitata* is the varnish tree of Burma. The varnish is obtained as a thick, white juice on tapping the tree, which turns black on exposure to the air; it has anthelminthic properties. The wood is tough and very valuable.

Melanterite, see COPPERAS.

Melanthiæ, natural order of bulbous, tuberous, or fibrous rooted plants, with white, green, or purple flowers, commonest in temperate countries.

Melba, Nellie (Mrs. Helen Porter Armstrong, née Mitchell), Dame (1861-1931), Australian soprano, b. at Burnley, near Melbourne, of Scottish birth, daughter of David Mitchell of Forfarshire, who had settled in Australia. Her first public appearance was on May 17, 1884, in Melbourne, and, the following year, she regarded herself fortunate in being soprano at St. Francis's Rom. Catholic Church in Melbourne. Gradually, however, she began to recognise her own capabilities, and persuaded her father to go with her to London in order that she might take lessons (1886). Sullivan rejected her for the Savoy Opera Company, Randegger would not receive her as a pupil; and Carl Rosa did not keep a promised appointment open for her. She then went to Paris, where she became the pupil of the celebrated Mme Marchesi. Soon she appeared in one of Marchesi's matinées as 'Mine Melba,' the name being derived from Melbourne. Her débüt in opera was at the Théâtre de la Monnaie, Brussels, 1887, as Gilda in *Rigoletto*. Her success was immediate, and was enhanced by her handsome face and figure. Later she appeared in *La Traviata*, *Lucia*, Delibes's *Lakmé*, Thomas's *Hamlet*, and at Covent Garden Theatre (May 24, 1888) as Lucia in *Lucia di Lammermoor*, though the critics were not enthusiastic over her voice. In 1889 she returned to Paris to continue her study with Marchesi, and from 1899, after her first appearance at the Paris Opera House, her record was one of constantly growing popularity. She toured Europe and America with equal success. During the First World War she raised over £100,000 for the soldiers, and was made D.B.E. In 1924 she made her farewell to the Australian operatic stage, taking the part of Mimi in *La Bohème*, and her farewell, in London, at Covent Garden, in the parts of Mimi, Desdemona, and Juliet. M. was a coloratura singer, pure and simple; she had a voice of great range and of perfect purity, and of absolutely even quality, yet left many unmoved by a certain coldness or non-human quality. She made one or two attempts at the bigger things, such as Elsa in *Lohengrin* and Elizabeth in *Tannhäuser*, but her success was less in proportion as the music and dramatic force increased in profundity of meaning; and, after taking the part of Brynhilde in *Siegfried*, in 1896,

with no success, she abandoned any further idea of being a Wagnerian singer. She married Charles Armstrong, son of a Queensland squatter, 1882. She was the first person to broadcast in a musical programme, from Marconi's station at Chelmsford (June 15, 1920). She wrote an autobiography, *Melodies and Memories* (1925). See lives by Agnes G. Murphy, 1909, and P. Colson, 1932.

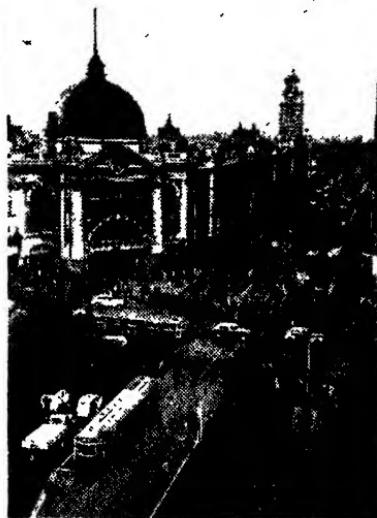
Melbourne, William Lamb, second Viscount (1779-1848), Eng. statesman, b. in London. His univ. education he received first at Cambridge, and at Glasgow. He entered the House of Commons for Leominster in 1805, and joined the Whig opposition, under the leadership of C. J. Fox. He accepted the chief secretaryship of Ireland in Canning's Gov., and this partial alienation from the Whigs was increased when he not only took office under Lord Goderich, but remained for a short time in the gov. of the duke of Wellington. In 1828 he was transferred to the Upper House. In 1830 he was home secretary in the gov. of Earl Grey. In 1834 Earl Grey retired, and William IV. sent for M., who became Prime Minister. On the accession of Queen Victoria in 1837 it became the duty of M. to instruct the young sovereign in her various duties to fit her to perform her part as the constitutional monarch. In 1841 his gov. was succeeded by that of Sir Robert Peel. See Lord D. Cecil, *The Young Melbourne*, 1948, and D. B. Wyndham Lewis, *Four Favourites*, 1948.

Melbourne, mrkt. tn. of Derbyshire, England, 7 m. from Derby on the London Midland Region railway. It is a market-gardening centre, and has boot and thread manufs. Pop. 4000.

Melbourne, cap. of Victoria, Australia, founded in 1835, in the reign of William IV., and named after Lord Melbourne, the then Prime Minister of England. It is on the Yarra Yarra, at the head of an extensive sheet of water called Hobson's Bay, 2½ m. from the anchorage. It is the second most populous city in Australia and the fifth city of the Brit. Commonwealth; the area of metropolitan M. is 212½ sq. m. It is prettily situated overlooking the bay, with wide streets, modern, regularly planned, and richly endowed with parklands. Victoria's magnificent Shrine of Remembrance, erected in 1933, of Grecian classical architecture, is situated on the summit of a low hill off St. Kilda Road, and is a landmark which may be distinguished from almost any part of the city and many miles S. as Port Phillip Bay, which is contiguous to Hobson's Bay, is entered. The city was designed by Robert Russell, a pupil of John Nash, the designer of much of the old-time Regent Street, London. The city council has recently adopted a zoning scheme for tn. planning in preparation for the future development of the city. Its building regulations preclude skyscrapers, but what it lacks in height is compensated for by grace and variety of architectural design. The architectural beauty of its many impressive buildings is outstanding.

The first settlement was founded in

1835 by John Batman, a sheep farmer of Tasmania, who, with John Pascoe Fawkner, purchased 700,000 ac. from natives, and began to farm on ground that is now covered by the city of M. Batman's purchase was, however, repudiated by Governor Bourke as a trespass on crown lands, but eventually reasonable conditions were imposed on the settlers. Batman, in fact, founded a free city, and it was kept free. The name of the founder has been preserved in remembrance in Batman Avenue, on the N. bank of the Yarra, and Batman ward of the city. M. was created a city by letters patent of



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MELBOURNE: COLLINS STREET AND FLINDERS STREET RAILWAY STATION

Queen Victoria dated June 25, 1847, and issued when M. was made the see of a bishop of the Church of England. Development was greatly accelerated by the discovery of gold at Ballarat and Bendigo in the early fifties. The main thoroughfare is Collins Street, the home of Australian finance, and the chief shopping streets are Bourke Street, Swanston Street, Elizabeth Street, and the 'Block' in Collins Street, where are the clubs and cafes.

More than one-fourth of M.'s total area of 7740 ac. is occupied by gardens and public parks. Within a few minutes' walk of the crowded business thoroughfares are the Botanic, Alexandra, and Queen Victoria Gardens in the S., Royal Park and the Exhibition Gardens in the N., the Treasury and Fitzroy Gardens in the E., and the Flagstaff Gardens in the W. The splendid botanic gardens, occupying

130 ac., and containing 10,000 species and plants, representing 2000 genera, owe much to the direction of Baron von Muller, who estab. relations with similar institutions all over the world, and founded a national herbarium, which is now the most complete extant collection of Australian dried plants. The later extensions of Wm. Robert Gulfoyle, curator, and the deepening of the Yarra, have contributed further to the development of the gardens. Thirteen ac. are occupied by lakes. The lily lake is a mass of colour during Nov. and Dec., and Middle Lake is a sanctuary to which hundreds of birds return at the opening of the duck-shooting season. 'The Separation Tree,' an old red-gum, stands in the gardens. It was a well-developed tree when the first white settlers arrived in Victoria, and the citizens of M. gathered round it on July 1, 1851, to celebrate the separation of the colony from New S. Wales.

Among the industries are engineering, brewing, tanning, printing, flour-milling, bacon curing, and brickmaking, while cheese, pottery, cigars, clothing, woollen goods, and leather are manufs.

There are many striking buildings in the city. With its tall spires rising against the background of commercial M. St. Paul's (Church of England) Cathedral, dominating the city, casts its shadow over the city's busiest intersection. It is built to a Gothic cruciform plan. The foundation-stone was laid by the governor, the marquis of Normandy, in 1880, but the cathedral was not opened for worship until eleven years later. The central spire, which rises to a height of 314 ft., was erected in 1931, and the completed cathedral was blessed by the archbishop of M. on April 30, 1933. Sandstone from the Barrabool Hills near Geelong, and limestone from Waurn Ponds, were the main materials used in its construction. Some of the interior granite columns were imported from England, but most of them were of Australian granite. St. Patrick's (Rom. Catholic) Cathedral is erected on an area of land on E. Hill granted by the gov. to the Rom. Catholic Church in 1849. The present cathedral, the third building on the site, was designed by W. W. Wardell, an eminent architect who had studied under Pugin, one of the most notable Gothic revivalists. St. Patrick's Cathedral, in early Gothic style, is cruciform in plan, and consists of a nave with side aisles, transepts, and a sanctuary surrounded by seven chapels. The eye of the visitor who enters the cathedral from the W. front is led to the chancel and the distant surrounding chevet chapel, the lofty arcading between the nave and aisles and the moulded columns of bluestone. Some of the entrances are richly adorned with carving and with deep recesses of columns and arch moulds. The dignity of the building externally is enhanced by its triple spires, the central spire rising to a height of 340 ft., and the carving and grouping at the E. end. An Act of the Imperial Parliament passed in the year 1850 decreed 'that the district of Port

Phillip should be separated from the colony of New South Wales, and should be named and designed as the colony of Victoria,' having a separate Legislative Council. But not until 1855, when the daily discoveries of gold and the rapid progress of the state were exalting public ideas, was a start made on the erection of Houses of Parliament. On Nov. 25, 1856, the first session of the first Parliament of Victoria was inaugurated. The present Parliament House was built during the great boom in the eighties on a site in front of the former House. Visitors to M.'s art gallery are met on every side with the words 'Purchased in the terms of the Felton Bequest.' In this sentence is written much of the hist. of the M. gallery. After his arrival in Australia in 1852, when twenty-one years of age, Alfred Felton estab. himself as a druggist and general merchant. His business prospered and he amassed a fortune. Unmarried and without relatives in Australia, he employed his constantly increasing wealth mainly on charitable and artistic objects, and bequeathed his estate of £378,000 for these purposes when he d. in 1904.

The M. mint is a branch of the Brit. royal mint, and was estab. by order of the council on Aug. 10, 1869, and opened on Jan. 12, 1872, to meet the problems created by the large discoveries of gold in Australia, and to reduce as far as possible its export. To-day the mint does not produce gold coins, but any one can sell gold there, and, if necessary, have it melted down and the fine gold extracted and weighed in his presence. Since the closing down of the Sydney mint in 1926 the royal M. mint has become the mint of the Commonwealth and the sole contractor for the production of Commonwealth coinage. Some of the original minting machinery is preserved within the building.

The univ. of M. was founded in 1854, and has an enrolment of between 8000 and 9000 students. It owes its origin largely to Hugh Culling Eardley Childers, a graduate of Trinity College, Cambridge, who was appointed inspector of schools in 1851 when only twenty-three years of age. One of his first efforts was to move for the estab. of a univ., and he recommended that £10,000 be provided for the purpose. In 1853 100 ac. of the present site were granted by the Crown, and the foundation-stone of the univ. was laid by the governor the following year. Wilson Hall, the prin. assembly hall, is the architectural gem of the univ. One of its outstanding features is the great S. window. A permanent conservatorium of music arose in 1910, when Dame (then Madam) Nellie Melba laid the foundation-stone of Melba Hall, towards the cost of which she was a substantial contributor.

M. has a large shipping trade; its port, called Port M. (considered to be one of the safest in the world), is 2½ m. away, but vessels of considerable size can ascend the Yarra to the heart of the city. There are wet and dry docks and safe anchorage for large vessels. Electric traction superseded cable tramways in

1925, and the suburban railways have also been electrified. The latter, like all Australian railways, are administered by a state dept.

Airport development projects on a large scale to provide for all unpredictable demands of civil flying have been launched in Australia where domestic airlines are booming month by month, and the chief airports are becoming increasingly important as international junctions. M.'s airport at Essendon (second in importance only to Sydney, the empire, and trans-Pacific terminal) is being further extended. Buildings will eventually extend over 100 ac., each airline company or operating unit occupying its own building. The landing area is capable of docking twenty-four aircraft simultaneously. Pop. of M. (1835) 177; (1946) 1,226,900.

Melchett, Sir Alfred Moritz Mond, first Viscount (1868-1931), b. at Farnworth, son of the famous chemist, Dr. Ludwig Mond. He became eventually chairman or director of a large number of industrial companies such as Brunner Mond & Company, the Imperial Chemical Industries, and the Mond Nickel Company. He became a Liberal M.P. in 1906, and was associated with that party until 1926, when he joined the Conservative party. Two years later he was created a peer, having been created a baronet in 1910. His son, *Henry Ludwig Mond*, second Viscount M. (1899-1919), was educated at Winchester and Cambridge Univ. After active service in the First World War he became a director of the Imperial Chemical Industries, the Mond Nickel Company, and other business concerns of which his father was the head. In 1923-24 he represented the Isle of Ely as a Liberal in the House of Commons, but in 1929 was elected as a Conservative member for one of the Liverpool divs. In 1932 he pub. *Modern Money*, in which he declared that the existing monetary system was unsound and unworkable, and had led to the unemployment of millions of people. He proposed the formation of a supreme economic council, and advocated payment of the Brit. war debt to America by the transfer of possessions in the W. Atlantic and the Pacific.

Melchites, name given to Christians in Syria and other parts of the E., who, acknowledging the authority of the pope, and the doctrine of the Church of Rome, use the Orthodox E. rite. They are chiefly to be found in Aleppo and Damascus. Their patriarch resides at Damascus.

Melchizedek, Canaanite priest, King of Salem in the time of Abraham (see Gen. xiv. 18). Called 'Priest of the Most High God' ('El-Elilijon'). Abraham acknowledged his priesthood by his offerings. The identity of Salem with Jerusalem has been generally admitted. A sect of Gnostics asserted M. to be an earlier incarnation of the Second Person of the Trinity, superior to Jesus Christ. The parallel drawn in Heb. vii. between Jesus and M. has caused the view to appear frequently among Christians that M. was an incarnation of Deity. See V. Burch, *The Epistle to the Hebrews*, 1926.

Melcombe, Baron, see DODINGTON
GEORGE BUBB.

Melcombe Regis, see Weymouth.

Meleager, son of the Calydonian king Oeneus, took part in the Argenautic expedition, and was the leader of the heroes who slew the boar which laid waste the fields of Calydon. His life depended on the burning down of a brand that was blazing on the hearth at the time of his birth, but which Althaea, his mother, snatched from the flames. He killed his uncles in a quarrel over the hide of the Calydonian boar, and his mother, to be avenged on him for slaying her brothers, threw the brand back into the fire, whereupon M. as the Fates had foretold, expired.

Meleda, see MIJET.

Meleda, is. in the Adriatic Sea, lying off the coast of Dalmatia. It is 23 m. by 4 m. of volcanic formation, and has been identified as the anc. Melita. Pop. 1500.

Melegnano (formerly Marignano), tn. in the prov. of Milan, Italy, 10 m. S.E. of Milan. It was the scene of the battle of Marignan in 1515, when the Fr. defeated the Swiss. Silk and linen are manufactured. Pop. 7000.

Melek, see MOLECH.

Melencke, tn. in Hungary, 50 m. S.W. of Temesvar. Pop. 9000.

Meléndez Valdés, Juan (1754-1817), Sp. poet, b. at Ríbera del Fresno (Badajoz), was a friend of Jovellanos, and for many years prof. of law at Salamanca. He was a pastoral and lyric poet, and was influenced by the ideas of the Fr. philosophical school. He collaborated with the Fr. invaders of his country, and was accordingly exiled in 1813. He d. at Montpellier. His poems include the eclogue *Batilo* (1780); odes *To the Arts* (1781); *To the Presence of God*; elegies *Parting* and *The Likeness*. His *Poesías* appeared in 1785.

Melenik, see MELNIK.

Meletianism, schism in the Church at Alexandria from the fourth to the middle of the fifth centuries. It arose out of a dispute between Meletius, bishop of Lycopolis in Egypt, and Peter, bishop of Alexandria; but the true grounds of the quarrel are obscure. There is evidence to show that Meletius's offence was the conferring of holy orders outside his own diocese (see M. J. Routh, *Reliquiae sacre*, iv., 1814-18). St. Athanasius, however, does not refer to any irregularity of ordination. He states that Meletius was condemned c. 305, having sacrificed to idols and calumniated the bishops of Alexandria. According to Epiphanius the real cause of dispute was the treatment of *lapsi*, i.e. those who in face of persecution had denied the Christian faith and afterwards repented. Meletius is said to have refused them absolution like the Novatians in Rome, and the Donatists in Africa, although the other Egyptian bishops followed the more lenient course. M. was considered by the Council of Nicaea; Meleti' was forbidden to ordain any more, and those who had received orders from him were to rank below the clergy ordained by Bishop Peter and his

successors. See A. P. Stanley, *Lectures on the History of the Eastern Church*, 1884, and C. J. Hefele, *A History of the Christian Councils* (trans.), 1894.

Melfi, tn. and episcopal see of Potenza Prov., Italy, at the foot of Mt. Vulture, 34 m. S. of Foggia. It was founded about 304, becoming the cap. of Apulia, under Norman dukes (1044). Its Norman cathedral was ruined by earthquake in 1851, though later rebuilt. Olives, vines, and grain are cultivated. Pop. 15,000.

Melford, Long, par. in the co. of Suffolk, England, situated 3 m. N. of Sudbury. Pop. 12,700.

Melfort, Loch, sea-loch of Argyllshire, Scotland. 11 m. S. of Oban.

Melianthus, or **Honey Flower**, genus of evergreen shrubs of the order Sapindaceae, with graceful pinnate leaves and clusters of racemes of fragrant flowers which in some species yield great abundance of honey.

Meli, Giovanni (c. 1740–1815), Sicilian poet, b. at Palermo. He practised medicine, and was prof. of chem. at Palermo Univ. (1787). His 'canzonette,' odes, and epigrams are mostly in the Sicilian dialect. His pastorals, like *Ecloge Peccatorie*, are exquisite specimens of their kind. In virtue of his *Farole morali* he may be called a Sicilian La Fontaine. The *Parnaso siciliano* contains his 'Poesie' (1874). A complete ed. appeared 1814, a posthumous one with an *Ode to Nelson* (1830), and a revised ed. by A. Alfano in 1908.

Mellilla, or **Milla** (anc. *Rusadir*), seaport garrison tn. on the N. coast of Sp. Morocco, with large cisterns and magazines. The harbour was opened (1902) as a port of commerce. Near by are lead and iron mines. Pop. (with garrison) about 77,200. See MOROCCO.

Melilli, tn. in the prov. of Syracuse, Sicily, 14 m. N.W. of Syracuse. Pop. 7000.

Mellilotus, genus of leguminous plants with trifoliate leaves, and small yellow or white flowers. *M. alba*, white mellilot, or Bokhara clover, is grown as a fodder crop, but has a bitter taste and rapidly becomes hard and woody.

Méline, Félix Jules (1838–1925), French statesman and economist, b. at Remiremont, became member of the National Assembly 1872. He was under-secretary of state for the dept. of justice in 1879, and became a member of the General Tariff Commission in 1881. In 1883 he was made minister of agriculture in Ferry's first ministry. In 1888 M. was made president of the chamber. On the death of Jules Ferry he became president of the general council of the Vosges. In 1893 he took over the editorship of *La République française*, which he retained till 1896. Becoming Premier in April 1896 he held office till June 1898. He was a strong anti-Dreyfusard. Became senator for Vosges, 1903. He pub. *Le Retour à la terre et la surproduction industrielle* (1905). During the First World War he became minister of agriculture under Briand, holding office till Dec. 1916. In 1920 he was elected president of the newly created General Commission

of Agriculture. See G. Lachapelle, *Le Ministère Méline*, 1928.

Mellinite: 1. Yellow clayey material, looking like yellow ochre. It has a sp. gr. of 2·24, is lamellar in structure, shining in streak, and is found at Amberg, in Bavaria. 2. The Fr. army name for picric acid (q.v.), a high explosive commonly called lyddite in England and shinosiso in Japan. It consists essentially of a mixture of trinitrotoluene and trinitrophenol (picric acid), the compound being less dangerous to handle and having a lower melting point than its constituents.

Meliotism, see under OPTIMISM.

Meliphagidae, see HONEY-EATERS.

Melissic Acid, fatty acid which occurs in beeswax and carnauba wax. It is prepared by heating melissyl alcohol with caustic potash, and forms a crystalline solid soluble in water.

Melissius of Samos (fl. c. 440 B.C.), Gk. philosopher of the Eleatic school. Against Heraclitus, Anaxagoras, and Empedocles M. taught the unity and immutability of being which could be apprehended by the mind alone. He modified the doctrine of his predecessor Parmenides of Elea by showing that reality is infinite and eternal, though he tended to make eternity an endless duration rather than that which is of its essence timeless. See R. Adamson, *The Development of Greek Philosophy*, 1908; T. Gomperz, *Greek Thinkers*, 1912; and J. Burnet, *Early Greek Philosophy*, 1920.

Melita: 1. Antq. name of Malta (q.v.).

2. Antq. name of Meleda (q.v.).

Melito, or **Meliton**, Saint, eccles. writer of the second century A.D., the champion of Catholic orthodoxy. He seems to have been bishop of Sardis under Marcus Aurelius, and apparently took part in the paschal, Marcionite, and Montanist controversies. Only fragments of his works are extant, including the *Ἐκλογαί*. See Eusebius, *Historia Ecclesiastica*, iv., 1672; J. Otto, *Corpus Apologeticum*, ix., 1842–1872; and C. Bonner, 'The Homily on the Passion by Melito,' in *Studies and Documents*, 1940.

Melito, seaport in the prov. of Reggio, S. Italy, 15 m. S.S.E. of the tn. of Reggio. Pop. 6000.

Melitopol, tn. in the Zaporozhe Region of the Ukrainian S.S.R., 125 m. S. of Dnepropetrovsk, near the shore of the sea of Azov. It is a centre of silk production, and also manufs. various kinds of agric. machinery. Pop. 75,700.

Melittis, or **Bastard Palm**, handsome Brit. perennial of the order Labiate with long ovate leaves and conspicuous flowers, creamy white and blotched or spotted with pink or purple. It occurs, rarely, in woods in the S.W.

Melk, tn. of Lower Austria, on granite rocks 180 ft. above the Danube. It has a Benedictine abbey founded in 1089. Pop. 2900.

Melksham, mrkt. tn. of Wiltshire, England, on the Avon, 8 m. S. by W. of Chippenham. Manufs. include cordage, coco-nut fibre, indiarubber goods, and woollens. Flour-milling is also carried on. There are saline baths near. Pop. 4000.

Mellan, Claude (c. 1598–1688), Fr. draughtsman and engraver, a pupil of Gaultier at Paris, of Vouet and Villamena at Rome. He early made engravings from the marbles of the Giustinian collection. His best works include 'St. Peter Nolasque'; 'Rebekah,' after Tintoretto; 'The Sudarium of St. Veronica' (1649) (portrait of Christ as imprinted on her handkerchief); and a portrait of Urban VIII. (1631).

Melleray, Mount, Trappist monastery in Co. Waterford, Eire. It originated in 1830, when a band of Trappist monks, expelled from France, arrived penniless and built themselves a shelter on Mt. M. The hundred monks there are vowed to lifelong silence, having wearied of the world and its ways. They keep open house without restriction or inquiry into the faith or religious beliefs of their visitors and no payment is expected. They live on a frugal diet and drink only water. They are famous for having cured many dipsomaniacs who come to M. for the 'cure.' The hospitality of the monks is as famous as is their reputation for piety and industry.

Mellifont Abbey, first Cistercian foundation in Ireland, founded in 1142 by St. Malachy (1094–1148), 4 m. N.W. of Drogheda, in Co. Meath. It surrendered to Henry VIII.'s commissioners in 1539. Now in ruins, its remains were excavated in 1884–85. See K. F. B., *Mellifont Abbey*, 1886.

Mellite, hydrated salt of alumina and metallic acid found in brown coal deposits. M. occurs in octahedrons with octahedral cleavage, or in granular nodules. Hardness 2–2·5; colour, honey-yellow; sp. gr. 1·65. It dissolves in nitric acid and is decomposed by boiling water.

Mellitus, Saint (d. 624), Rom. Benedictine abbot, was sent by Gregory the Great to England in 601 at the head of a group of missionary monks to carry on the work of St. Augustine (q.v.). The first bishop of London, he was exiled for refusing communion to the apostate sons of King Sigebert, but in 619 was recalled to Kent and became archbishop of Canterbury.

Mellon, Andrew William (1855–1937), Amer. banker and politician, b. at Pittsburgh, Pennsylvania. He was educated in what is now the univ. of Pittsburgh, and then entered the banking house which belonged to his family. Industrial development conduced to the prosperity of his chain of banks and he also became the largest producer of aluminum in the U.S.A., and so became one of the three or four wealthiest men in the world. In 1921 he was appointed secretary of the treasury, and later came to London as Amer. ambas. He presented to America an art collection estimated to be worth \$10,000,000. In 1911 he founded the M. Institute at Pittsburg, the world's largest institute for scientific research; the building was dedicated in 1937. He came to Europe in July 1931 to conduct negotiations arising out of the Hoover (q.v.) proposal for postponement of payment of war debts. He wrote *Taxation, the*

People's Business (1924). See life by P. H. Love, 1929.

Melmoth, William (1666–1743), Eng. lawyer, and anonymous author of *The Great Importance of a Religious Life* (1711). He commented on the immorality of the stage, in the form of letters to Defoe.

Melmoth, William (1710–99), Eng. littérateur and eloquent prose writer, son of above. He wrote *Fitzosborne's Letters* (1742), trans. Pliny's *Letters* (1747), and some of Cicero's works (1753–77). His *Memoirs of a Late Eminent Advocate* (1796) deals with his father's life. See J. Nichol, *Literary Anecdotes*, II, III, 1812.

Melenik, or Melenik: 1. Tn. of Bulgaria, 65 m. N.N.E. of Salonika. Pop. 5000. 2. Tn. of Bohemia, Czechoslovakia, on the Elbe, 18 m. N. by E. of Prague, noted for wine and apricots. Pop. 5000.

Melo, or Villa de Cerro Largo, tn. of Uruguay, cap. of Cerro Largo dept. on the Tacuari. 200 m. N.N.W. of Monte Video. It is the seat of a suffragan bishopric. Coal, granite, and metal ores are mined. The surrounding dist. is agric. Pop. 12,000.

Melocactus, typical genus of the family Melocactidae, succulent plants found in the W. Indies and elsewhere in tropical America. It has a conical, ribbed, and globose stem and melon-like rosy tubular flowers and is also called melon-thistle. The best known species is *M. communis*, or Turk's Cap or Pope's Head cactus—the head bearing the flower is red and like a Turkish fez in form.

Melodion, see CONCERTINA.

Melodonus, see MELUN.

Melodrama, originally a musical drama, or a drama interspersed with vocal or instrumental music. Now it is generally a non-operatic play of a semi-tragic or serious character, characterised by rapid action, sensational situations, and violently expressed emotions, with marked contrast between hero and villain. The two earliest plays of this type in the Eng. language are *Deaf and Dumb* (1801), by Thomas Holcroft (adapted from the Fr. *melodrame* by Bouilly), and *A Tale of Mystery* (1802). The elements of M. had, however, existed long before this time, and were present in some of the Elizabethan tragedies as well as in late eighteenth-century romantic drama. More modern examples are Henry Irving's productions of *The Lyons Mail* and *The Belle*, and among famous Victorian Ms. were *Sweeney Todd*, the *Demon Barber of Fleet Street* and *Maria Marten*, or the *Murder in the Red Barn*.

Melody, succession of musical sounds so arranged as to have a pleasing effect on the ear. It differs from harmony in being the production of only one voice or instrument, whereas harmony is the result of the blending of different voices or sounds. In the hist. of music unaccompanied M. was the only music until comparatively modern times, when harmony was introduced; but whereas harmony is not essential to musical art M. is. Rhythm is a most important element in M. whether it be the free rhythm of plain-song

or the equal-measured rhythm of music of the classical period or that of the most modern composers. Much subtle elaboration of M. is to be found (e.g.) in Beethoven's sonata subjects. His Ms. are often clearly harmonic in their structure and, similarly, in Bach's music harmony is a basis of M. M., like music in general, may be said to be either of the class which stresses beauty of pattern or that which is more concerned with depth of expression. M. most abounds in contrapuntal music and, particularly, the fugue. See P. Scholes, *Oxford Companion to Music* ('Melody'), 1941.

Meloidæ, see CANTHARIDÆ.

Melon, fruit of *Cucumis melo* (order Cucurbitaceæ), valuable tropical plant which has been cultivated for many centuries. In Britain it is almost invariably grown in pits or hot-houses. The colour of the flesh may be green, scarlet, or white. The size of the fruit, generally globular, that of a giant gourd. See also WATER.

Meloria (ancet. **Manaria**), small is. in the Mediterranean, 4 m. from Leghorn harbour. The Genoese here defeated the Pisans at sea (1284).



THE VENUS DE MILO

Melos, is. in the Aegean Sea, belonging to Greece, one of the Cyclades group. It is about 14 m. long and 8 m. broad, and covers an area of 64 sq. m. It is of volcanic formation, and has sev. mt. peaks over 1000 ft. high, Mt. Prophet Elias rising to 2548 ft. The is. was first colonised by the Phenicians, and was taken by the Athenians in 416 B.C. In 1537 it was seized by the Turks. M. is rich in sulphur, gypsum, manganese ore, salt, lead, and zinc. The famous statue, the Venus of Milo, now in the Louvre, Paris, was discovered near Kastro, the cap., by a

peasant in 1820. Early pottery and paintings were discovered in the prehistoric settlements at Phylakopi; much damage was done here during the Second World War. See Evans, Hogarth, and others, *Excavations at Phylakopi*, 1904.

Melos, or **Milo**, tn. of New York, U.S.A., in Yates co., lying between the lakes of Seneca and Keuka. Pop. about 5000.

Melpomene, in Gk. mythology, the muse of tragedy. She is generally represented fully draped, with a calm expression holding a bearded, open-mouthed mask.

Melrose (Celtic *mao ros*, bare moor):

1. Police burgh and m.r.k.t. tn. of Roxburghshire, Scotland, on the Tweed, at the foot of the triple Eildon Hills, 37 m. S.E. of Edinburgh. The famous Cistercian abbey was founded (c. 1136) by David I., and is celebrated by Scott as 'Kennaquhair.' Partly destroyed by Edward II. (1322) and Richard II. (1385), it was wrecked during Lord Hereford's expedition (1545) and by the Reformer. The Decorated and Perpendicular styles prevail, and its beautiful traceried windows are famous. It contains, *inter alia*, the tomb of Alexander II., the heart of Robert the Bruce, and the reputed tomb of the wizard, Michael Scott (1175-1234). Abbotstord, residence of Scott, is about 3 m. distant. Old M., 2½ m. E., is the site of a still more anct. Columban monastery, estab. about 640 by St. Aidan, and deserted by 1075. There is an old Border peal (fort) at Durnick. Pop. 2000. See *Chronica de Maitros*, 731-1275 (1684 and 1835, Bannatyne Club). 2. City of Middlesex co., Massachusetts, U.S.A., 7 m. N.W. of Boston, of which it is a suburb. It contains Middlesex Fells, a state reservation, and Spot Pond, a large reservoir. Manufis. include boots, rubbershoes, silver, and leather goods. Pop. 25,300.

Meltham, par. and tn. of the W. Riding, Yorkshire, England, 5 m. S.W. of Huddersfield. There are cotton, thread, and woollen mills, and tractors are manufactured. Pop. 5000.

Melting, change of physical state when a solid is converted into a liquid by the application of heat. This change takes place at a definite point in the case of pure substances which do not decompose chemically under the action of heat. The presence of impurities depresses the M.-point and this furnishes a method of determining the purity of a substance and an important method of determining molecular weights. As an illustration of the fact that the presence of impurity lowers the M.-point, it may be noted that salt is used to remove ice from pavements. In the case of the determination of molecular weights, it is found that the freezing-point of a dilute solution of a given substance is depressed below that of the pure solvent by an amount proportional to its concentrations, i.e. the mass of dissolved substance per 100 gm. of the solvent. Freezing mixtures also depend on the fact that the presence of impurity depresses the M.-point. Some solid substances contract in volume when melted, while others expand.

This can be shown more clearly by considering the reverse operation, i.e. solidification; thus a substance which contracts on M. will expand on solidifying. Taking water as an instance we find that when water freezes its volume increases. This explains the bursting of pipes in winter, and also the fact that ice floats in water, since, because of this expansion, volume for volume, it is lighter. On the other hand, solid paraffin wax sinks in liquid wax, showing that liquid paraffin wax contracts on solidification.

Increase of pressure has little effect on the M.-point, unless the increase be large. Then it tends to depress or elevate the M.-point according to the substance. This increase of pressure lowers the M.-point of ice. The making of a snowball illustrates this point. The snow is pressed together, causing some of the snow to melt, and when the pressure is removed this melted snow freezes again, forming the ball into a compact mass. M. is employed commercially to separate bodies of different M.-points, and to take copies of objects as illustrated in an iron foundry. In the latter case bodies which expand on cooling are used so that every corner of the mould may be filled.

Melting-point.—The determination of the M.-point of a substance is very important in the methods of organic chem., and affords a ready method for the detection of the presence of a substance. Many methods are employed to determine the M.-point, the most common of all being to draw a glass tube out to a very fine tube and seal one end. Very small pieces of the substance are introduced into the tube, which is then tied to the bulb of a mercury thermometer. Both are immersed in a bath of water or some other liquid, which is heated until the substance melts. The substance may then be allowed to cool and the temp. at which solidification commences can be obtained. The substance is again melted, and the M.-point read off on the thermometer. Three or four readings may be taken in this manner, the M.-point being the mean of the readings. Some M.-points are (°C.) mercury, 38·9; tin, 232; zinc, 419; brass, 900; steel, 1400; tungsten, 3380. See also METALLURGY (METALLURGICAL FURNACES).

Melton, par. and vil. of Suffolk, England, on the Deben, 9 m. E.N.E. of Ipswich, with machine works. Pop. 2000.

Melton Mowbray, markt. tn. of Leicestershire, England, on the Eye, near its confluence with the Wreake, 15 m. N.E. of Leicester, in normal times noted for pork-pies and Stilton cheese. There are iron-ore quarries, and smelting and blasting furnaces. It is also noted as a hunting centre (Quorn, Belvoir, and Cottesmore hounds). The tn. estate of M. M., an independent body founded 400 years ago, still owns the market tolls and the corn exchange. The cattle market is leased by them to the urb. dist. council. Similarly its auct. educational functions are now vested in the co. council, to whom it leases the land on which stands the tn.'s technical college.

Apart from that, the tn. estate maintains to-day two parks, a sports ground, and other recreational amenities. Its income is £5000 a year. The estate is vested in twelve feoffees, elected for life or so long as they reside in the par., and is managed by two tn. wardens, elected annually. Pop. 12,000.

Melton, West, par. and vil. of the W. Riding, Yorkshire, England, 5 m. N. of Rotherham. Pop. 4000.

Melun (ancet. *Melodunum*), cap. of Seine-et-Marne dept., France, on the Seine, 28 m. S.E. of Paris. It has mediæval churches, a Renaissance tn. hall, and a ruined palace. M. was captured by Henry V. of England in 1420, but the inhab., with the aid of Joan of Arc, recovered it in 1430. Manufs. include linens, cottons, woollens, pottery, and leather. M. suffered some damage from bombing in the Second World War, and in the 1944 advance of the Allies into France, Amer. tanks swept around the S.E. of Paris to M. on Aug. 20, driving the Gers, back across the Seine. When the allied troops had reached the Seine at M. above, and at Mantes Gauchecourt below, the cap., the position of the Ger. garrison in Paris became untenable. Pop. 17,500.

Melun et de Vaux, Vicomte de, see FOQUET, NICHOLAS.

Melusina, or *Mélusine*, in Fr. folklore, a water fairy, half woman and half fish; the daughter of Elignas, king of Albania. She married Count Raymond on the condition that he would never seek her on Saturdays, when she was accustomed to shut herself up alone. When they were married she built him a castle called Lusignan Castle. Raymond broke his promise, and did visit her on a Saturday, so she changed into a serpent and escaped from the castle by a window. Since her escape she was supposed to have visited the castle, uttering cries a little time before the death of the lords of Lusignan. Hence the expression 'Cris de mélusine,' which is still heard in some provs. in France. Jean d'Arras made this legend the subject of one of his stories in 1388. There is an Eng. prose version, *Melusyne*, of the Lat. prose story of Jean d'Arras. See J. Dunlop, *History of Fiction*, 1888, and S. Baring Gould, *Curious Myths of the Middle Ages*, 1897.

Melville, Melvill, or Meivine, Andrew (1543-1622), Scottish scholar and reformer, b. at Baldovie, Angus. After leaving St. Andrews with a high reputation for learning, he set out for the Continent (1564), becoming regent of St. Marceon College at Poitiers (1566). Leaving for Geneva owing to political troubles (1568), through Beza's influence he was appointed prof. of humanity at Geneva Academy (1568-74). On returning to Scotland, he became principal of Glasgow Univ. (1574-1580), and rendered the highest services to Scottish education. He was principal of St. Mary's College, St. Andrews (1580-1607). A staunch and fearless champion of Presbyt.ism, he was one of the foremost in bringing about the fall of episcopacy in Scotland, and helped to draft the *Second Book of Discipline* (c. 1581). His extreme and outspoken views

frequently brought him into disfavour. He was forced to flee to England (1584-85), but then returned and was made rector of St. Andrews (1590-97). Summoned with other ministers to London (1606) to confer with James I., he was imprisoned in the Tower till 1611. James refused his petition to return to Scotland, and he accepted the chair of biblical theology at Sedan. See lives by T. McCrie, 1819, and J. Morrison, 1899; also A. Gardiner, *History of England, 1603-16*, i., 1863, and A. Lang, *History of Scotland*, 1902.

Melville, George John Whyte-, see WHYTE-MELVILLE.

Melville, Henry Dundas, first Viscount, see DUNDAS, HENRY.

Melville, Herman (1819-91), Amer. author, b. in New York city of a family of Scottish descent. At seventeen he embarked as a seaman on a whaler, deserting his ship when it reached the Marquesas Is. in the S. Seas, and being for months a captive among the cannibal tribes of Nukuheva. He made his escape, joined another whaler, and deserted it when it reached the Tahitis. He eventually joined a regular Amer. man-of-war, and after serving his term of enlistment returned to Boston in 1844. In 1846 he pub. his first book, *Typee*, a wonderful picture of life among the cannibals of the Marquesas. *Omoo*, in 1847, likewise dealt with life in the Polynesian is. In them he attacked the Amer. missionaries, advising them to christianise Christianity before seeking to evangelise savages in whom he found many splendid traits. In 1850 he pub. *White-Jacket*, which embodied his experiences on an Amer. man-of-war, and it was largely due to his unsparing pen that corporal punishment was abolished in the Amer. Navy. In 1851 appeared his greatest book, *Moby-Dick*. This is a true prose epic of the sea: a story of the hunting of whales and of the thousand moods of the seas. M. pub. many other books after this, but nothing comparable with those mentioned. See lives and studies by R. Weaver, 1921; W. Braswell, 1936; and R. Anderson, 1939; also W. E. Sedgwick, *Herman Melville: the Tragedy of a Mind*, 1945.

Melville, James (1556-1614), Scottish reformer, b. near Montrose, a nephew of Andrew, whose fortunes he shared to a large extent, becoming under him tutor in Glasgow Univ. (c. 1575) and prof. of oriental languages at St. Andrews (1580). From 1586 he took an active part in Church controversy, and was moderator of the General Assembly (1589). Summoned to London with his uncle (1606) on the latter's imprisonment, he was forbidden to return N. beyond Newcastle-on-Tyne. His *Diary, 1556-1601* was printed by the Bannatyne Club (1829) and by the Wodrow Society (1842).

Melville, or Melvill, Sir James, of Halhill, Fifeshire (c. 1535-1615), Scottish soldier, historical writer, and diplomatist. He was page and, later, privy councillor to Mary Queen of Scots, and accomplished various missions for her. His *Memoirs of My own Life*, first pub. by G. Scott (1683), were ed. by Thompson (Banna-

tyne Club, 1827-33). See J. A. Froude, *History of England*, viii., 1856-70, and Chambers's *Biographical Dictionary of Eminent Scotsmen*.

Melville: 1. Is. off the coast of N. Australia, separated by Clarence Strait from the mainland. It is 70 m. long and 30 m. broad, and was discovered by King. 2. Largest of the Parry Is. in the N. Polar Sea, Arctic America, separated (W.) by Fitzwilliam Strait from Prince Patrick Is., by M. Sound (S. and S.E.) from Victoria Land and Prince of Wales Land. It was discovered and named by Parry (1819-20). Length 200 m., breadth 130 m. 3. Peninsula in N. Canada, bounded W. by Boothia Gulf, N. by Fury and Hecla Strait (separating it from Baffin Land), E. by Fox Channel. Length 250 m., average breadth 100 m. 4. Sound, 250 m. long by 200 m. broad, communicating with the Arctic Ocean and Baffin Bay, S.E. of M. Is.

Melvine, Andrew, see MELVILLE.

Melykut (deep well), com. and tn. of Bacs-Bodrog Prov., Hungary, 17 m. from Maria Theresiopol. Pop. 8000.

Melyris, genus of metallic-coloured beetles, with long narrow bodies; native of Cape Prov.

Meizi, Francesco de' (c. 1491-1568), It. amateur painter, of a noble Milanese family, friend and pupil of Leonardo da Vinci. The 'Vertumnus and Pomona' at Berlin is often ascribed to him. To him is due the preservation of Leonardo's writings, which, with other belongings, were bequeathed to him.

Membrane, in anatomy, indicates the textures of the animal body which, arranged as laminae, cover organs, line the interiors of cavities, and take part in the formation of the walls of canals and tubes. For mucous M. see DIGESTION and EPITHELIUM; for deciduous Ms. which enclose the fetus see PLACENTA. See also SEROUS MEMBRANES.

Memel: 1. (Lithuanian *Klaipeda*), seaport tn. (founded 1252) of the Lithuanian S.S.R. on the Kursches Haff, 72 m. N.N.E. of Königsberg. It has a well-fortified harbour and is a centre of the Baltic lumber trade. Before the Second World War it had iron foundries, shipbuilding yards, and breweries, and manus. of machinery, chemicals, etc. It was captured by the Russians in 1915 and evacuated in the same year. After the First World War it was renamed Klaipeda. Pop. 50,000. 2. M. Terr., before the First World War was an area of 1000 sq. m. with a pop. of 150,000 on the N.E. border of Germany. Together with the port of M. it was separated from Germany by the treaty of Versailles and assigned to Lithuania. When the National-Socialist party secured the ascendancy in Germany agitation for reunion of the ter. with Germany became a major political issue. In 1935 the pro-Nazi party in the M. Dist at length became the largest party in that assembly and secession from Lithuania was thenceforth their chief object. The Lithuanian Gov. sought to prevent secession by making large concessions to the Ger. McMellanders, but in vain, and, in

the elections at the end of 1938, the pro-Nazi party secured nearly 90 per cent of the total votes. After the seizure of Czechoslovakia (March 1939) the Ger. Gov. sent an ultimatum to Lithuania demanding the surrender of the M. Ter. Lithuania was powerless to resist and the ter. was reincorporated in the Reich, a free zone being secured for Lithuania in the port of M. In the Second World War M. and ter. were taken by Russia, together with the rest of Lithuania. 3. Riv. in Russia and Germany called in the former country the Niemen (Nyeman). Rising in Minsk Region, it flows W. to Grodno and enters the Kurisches Haff by the Russ and Gilge mouths. Near Grodno a canal connects it with the Bober and Vistula.

Memelland, or Memel Territory, see under MEMEL.

Memline, Memling, or Hemling, Hans (c. 1430-94), Flem. painter. His works were well known in his own time. He painted a 'Virgin and Child' for Sir J. Daine, and his 'Last Judgment' and the shrine (1480) containing the reliques of St. Ursula in the museum of the hospital of Bruges were very famous. M.'s colouring is beautiful, and his figures are very fine; of all the Flem. masters of the fifteenth century, only the brothers Van Eyck are superior to him (*see also FLEMISH ART*). See W. H. J. Weale, *Hans Memline*, 1901.

Memmi, Lippo, di Filippuccio (d. 1356). It. painter, brother-in-law of Simone di Martino, with whom he often worked. Most of his work was done between 1332 and 1351. The fresco over the door of the convent of the Servites at Siena and a small Madonna acquired for the Berlin Museum are the finest of the works attributed to him.

'Memmi,' Simone, Simone Martini, or Simon of Siena (c. 1283-1344). It. painter, pupil of Durcio. He was a friend of Petrarch, and painted portraits of Laura and Petrarch, while the poet dedicated two sonnets to him. He shared the 'Gothic' ideals of the Pisani, his influence on the Siennese school of painting being evident for the two following centuries. The frescoes in the church of Santa Maria Novella at Florence, 'The Annunciation' in the Uffizi, and the triptych in Antwerp Gallery are his work.

Mömmingen, tn. of Bavaria, Germany, 33 m. S.S.E. of Ulm. It trades principally in cheese and hops, and manufus. woollen and cotton fabrics and soap. Pop. 16,300.

Memon, in Gk. legend, son of Eos (dawn) and Tithonus. He fought for his uncle, Priam of Troy, against the Gks., but after heroic exploits was slain by Achilles. Also represented as an oriental hero, he is not definitely called king of Ethiopia or Egypt till the later part of the fifth century B.C. M. has been identified with Amenhotep (Amenophis III.), in whose honour colossal statues were erected near Thebes. One of these was supposed to give forth musical sounds at dawn when touched by the sun's rays. See Quintus Smyrnaeus, *Posthomeric*, ii.; G. Rawlinson on *Herod.*, ill., 251; J. Jacobs, *Über die Geister des Memon*, 1830; R. Curzon in *Edinburgh Review*, 1886; and

Sir J. Gardner Wilkinson, *Topography of Thebes*, 1843.

Memoirs, form of literature common to all nations in all periods. They may be described as a narrative of events happening or purporting to happen in the lifetime of the author, and relating to his entire life or to some portion of hist. with which he has been intimately connected or for which he has had access to particular sources of information. M. include not only such productions as bear that title, but also such as are styled confessions, reminiscences, souvenirs, diaries, and the like. They differ from hist. in that they do not purport to cover all of even the significant events of a period, and frequently ignore a strict chronological order. Among the earliest examples of M. we may class the *Anabasis* and *Memorabilia* of Xenophon, Julius Caesar's *Commentaries*, the Gospels and the Acts of the Apostles, and the *Confessions* of St. Augustine. Fr. literature is especially wealthy in M., probably because, as Chateaubriand remarks in his *Génie du Christianisme*, their form and the scope which they afford to the author's personal pride and prejudices are peculiarly suited to the Fr. temperament. M. are found covering the whole of Fr. hist. and every facet of Fr. life from those of Froissart and Juvyville to the *Confessions* of Rousseau and, later, F. R. de Chateaubriand's celebrated *Mémoires d'outre tombe* (1848) and F. P. G. Guizot's *Mémoires pour servir à l'histoire de mon temps* (1858-67). One cannot say that elsewhere in Europe M. have a proportionate value as historical sources, though mention must be made of the immortal diaries of Samuel Pepys and John Evelyn, and of Goethe's M. M. are especially adapted to reveal in great detail the social and cultural life of short periods of hist.; and among recent Eng. works of this kind are Oliver Gogarty's *As I Was Going down Sackville Street* (1937), *Tumbling in the Hay* (1939), and Sir Ronald Storrs's *Orientations* (1943). See also BIOGRAPHY.

Memorial Day, see DECORATION DAY.

Memory is the name given to the capacity for remembering, that is, for reviving or utilising past perceptions, activities, or other experiences. A little reflection convinces us that these activities of remembering are of many different kinds. Thus a man picturing in his own mind a past perception is said to be remembering it, or when he is giving an account in words of the activities of the past day. When we see that a dog avoids a place where he has been hurt, we attribute this to his M. of his past experience though we know nothing of his thought but only observe that his past experience is affecting his present behaviour. Recognition is also regarded as evidence of M., as when we recognise the face of an acquaintance, although we could neither have pictured his face to ourselves nor have described it. M. thus stands for no single kind of mental activity, but is a name given to a number of different types of mental process which have in common the practical end of

co-ordinating present behaviour with past experience. A particularly important distinction is that between habit or mechanical M., found most purely in the activity of learning dates or tables by heart, and logical memory, which is the much more important activity of learning material in such a way that its meaning is understood and can be reproduced in our own words. Mechanical learning has some place in the early stages of education but it is out of place in later school activities such as hist., science, mathematics, where what is required is not literal reproduction but understanding. Neglect of this distinction led to the trivialities of the associationist psychology in which learning by heart was regarded as the typical process of M. and the processes of thought were regarded as due to the linking together of ideas by the laws of association (q.r.). These laws are no doubt of importance in the relatively unimportant field of habit M. They explain, however, only that part of M. which is the formation of mental habits. Logical M. requires more complex conceptions of the organisation of experiences into units in accordance with the principles of Gestalt psychology. We can remember a mathematical principle when we see it as a whole, organised in relation to the rest of our knowledge. The essential step towards remembering is insight or understanding, not the linking together of ideas by association. There is no experimental evidence in support of the common notion that different individuals differ in the effectiveness of their M. as a whole or that children have better Ms. than adults. Different individuals certainly differ in particular directions of M. ability. For example, some can perform what appear miraculous feats of mechanical remembering through the possession of a particularly stable and accurate form of mental imagery known as eidetic imagery. Children generally do better than adults at tasks involving merely mechanical M., but adults of not too advanced age are generally better at tasks requiring logical remembering. At a great age inability to remember new things may be the result of general loss of efficiency of the senile brain. Amongst adults of young to middle age the differences in capacity for logical remembrance are almost entirely due to differences in general intelligence (q.r.). There is no reason for believing that M. can be improved by exercise, although remembering can be improved by the use of improved methods of learning or by the use of mnemonics (q.r.). The most common cause of forgetting is obliviscence or fading through lapse of time and the incidence of new experiences. Freud has also drawn attention to a kind of forgetting which is important in the causation of mental disorder, the active banishment of unpleasant Ms. from the mind which he calls repression. It has been argued that this form of forgetting is found to some extent amongst normal people as well as amongst those suffering from neurotic disorders. See H. Ebbinghaus, *Über das Gedächtniss*, 1885; H. Bergson

Matter and Memory (trans.), 1911; H. J. Watt, *The Economy and Training of Memory*, 1909; S. Freud, *Psychopathology of Everyday Life* (trans.), 1911; T. H. Penru, *Remembering and Forgetting*, 1922; F. C. Bartlett, *Remembering*, 1932; and C. A. Macé, *Psychology of Study*, 1932.

Memphis: 1. Anct. city of Lower Egypt on the Nile, its ruins standing 12 m. S. of Cairo. It was said to have been built by Menes, the first historical king of Egypt, and became the first cap. of the entire kingdom of Egypt. It grew to great importance under Apophis or Pepy (c. 1700 B.C.), who built the pyramid 'Men-nofer' near by. Among its numerous anct. buildings were temples of Ptah or Hephestos, of Isis (sixth century B.C.), of Serapis, and of Ra. The pyramids and statues of Rameses II. remain, and the ruins of Saqqara close by. The Noph of the O.T. (Is. xix. 13; Jer. ii. 16) is probably M. The city declined rapidly after the Arab conquest. The modern vil. of Mit-Rapind (Mitranieh) in Giza Prov. marks the site. See Sir W. Smith, *Dictionary of Greek and Roman Geography*, 1854-57; B. Poole, *Cities of Egypt*, 1882; J. Quibell, *Excavations at Saqqara*, 1908-1909; C. M. Firth and B. G. Gunn, *Excavations at Saqqara: Teti Pyramid Cemetery*, 1926; and J. Capart, *Memphis*, 1930. 2. Co. seat of Shelby co., Tennessee, U.S.A., on the Mississippi, 15 m. from S.W. corner of the state. It is a port of entry, and the most important tn. on the riv. between St. Louis and New Orleans. It has many fine buildings, and is a great cotton market. Other products are lumber, oil, grain, groceries, confectionery, machinery, and shoes. An iron railway bridge (completed 1892) spans the riv. The surrounding area is subject to floods, and the U.S. Army flood control is organised from M. Pop. 293,000.

Mena, Juan de (c. 1411-56), Sp. poet, b. at Cordova, was Lat. secretary and historiographer to his patron, John II. of Castile. He joined the Italianate school of Santillana (q.r.), and Dante's influence is evident in the ideas though not in the form of his poems. His chief work, *El Laberinto de Fortuna o Las Trezientas*, a didactic allegory, first appeared in 1496. (See Foulech6-Delbos's ed., 1904.) Nunez (1552) and Sanchez (1804) produced eds. of his works. See V. F. Romero, *Epicedio*, 1602; G. Ticknor, *History of Spanish Literature*, 1849.

Menado, or Manado, residency and tn. in the is. of Celebes, Dutch E. Indies. The tn. is a free port, with a large trade to Batavia and China, and one of the most beautiful of the Dutch E. Indies. Pop. (residency) 1,139,200; (tn.) 7500.

Mense, or **Menenum**, see MINEO.

Ménage, Gilles (1613-92), Fr. scholar and writer, b. at Angers. For some time he lived in the household of Cardinal de Retz, but soon quarrelled with his patron, and founded a salon known as the Mercure, which, although gaining him European fame, also made him many enemies, amongst others, Molière and Boileau. His publs. include *Origines de la langue française* (1650); *Dictionnaire*

Étymologique (1650 and 1670), etc. See life by Baret, 1859, also *Menagiana* (a collection of his oral opinions) pub. in 1693 and subsequently enlarged by La Monnoye (1715).

Menagerie, small collection of wild animals kept in close captivity for display. Kings of early times used to bring back wild animals for gladiatorial shows and exhibition. Private collections later became common, and until the early nineteenth century such a one was maintained at the Tower of London. It is described by Pepys. From these collections developed the great zoological gardens, the travelling Ms. of Boston and Wombwell (1864), and the present-day circuses of performing beasts.

Alexis; he had Theophrastus for his teacher, and Epicurus for a friend. M. was a handsome, light-hearted, and elegant Gk. He was drowned while swimming in the harbour of the Piraeus. M. wrote more than 100 comedies, which were in high repute among his countrymen, at least after his death; but we possess mere fragments of them (*Omnium Atticorum Fragmenta*, ed. by Kock, 1880-88). We know something of their character, however, from the imitations of them by Terence and Plautus. Pleasant and refined wit, clear, sententious reflection, and a vein of real earnestness at times are the qualities most apparent in them. Some fragments of his work were found in Egypt in the twentieth century.



RAILWAY BRIDGE, MENAI STRAIT

British Railways

Menai Bridge, tn. in Anglesey, N. Wales, on M. Strait, 2 m. S.W. of Bangor. Pop. 2000.

Menai Strait, channel separating Anglesey from Caernarvonshire, N. Wales. Its maximum length is 13 m., and breadth 2 m., and it is famous for the suspension and tubular bridges crossing it. The former, constructed by Telford (1819-25), is 1710 ft. long. The latter, constructed by Robert Stephenson in 1850, is 1380 ft. long, and is known as the Britannia Bridge. A scheme is on foot to utilise the tidal energy of the strait by means of three dams.

Menaldumadeel, tn. of Friesland prov., Netherlands, 65 m. N.E. of Amsterdam. Pop. 12,000.

Menam, riv. of Siam, rising in the Shan Mts., near the Burmese frontier, and flowing mainly in a southerly direction for a course of about 900 m., finally falling into the gulf of Siam. It is navigable for small boats to Chiang-Mai, 75 m. above Mutka, and for riv. steamers to Paknam, but its mouth is obstructed by sandbanks. Its chief trib. is the Meiping.

Menander, b. 342 B.C., the most celebrated Gk. poet of the New Comedy. b. at Athens. His uncle was the comic poet

See J. A. F. Meineke, *Fragmenta Comitorum Graecorum*, 1841, and *Selections*, ed. by W. G. Waddell, 1927. A text and trans. of all existing fragments is pub. in the Loeb Library.

Menander, Arrius, Rom. jurist of the second century A.D., fl. under Severus and his son Caracalla (193-217). The *Digest* contains six excerpts from M.'s work. *Militaria*, and *Acta*. Macer quotes M. See Ulpian, *Ad Edictum*.

Menant, Joachim (1820-99), Fr. Assyriologist, b. at Cherbourg. His studies on the cuneiform inscriptions are renowned, and with Oppert he introduced the study of Assyriology into France, delivering lectures at the Sorbonne (1869). His works include *Recueil d'alphabetes des écritures cunéiformes* (1860); *Le Syllabaire assyrien* (1869-73); and *Ninive et Babylone* (1887); and various Assyrian textbooks and grammars.

Menasha, banking city of Winnebago co., Wisconsin, U.S.A., on Winnebago Lake, 14 m. N.N.E. of Oshkosh. Pop. 10,400.

Menasseh, Ben Joseph Ben Israel, see MANASSEH (BEN JOSEPH).

Menavia, see MAN, ISLE OF.

Mencius (latinised form of Mang-tsze,

Meng-tseu, or Meng-tsi (c. 372-c. 289 B.C.), Chinese sage, b. in Shantung, ranking next to Confucius as a moral teacher, author of one of the 'Four Books' which constitute the Chinese Scriptures. He was brought up by his mother, who is venerated in China as the pattern of all mothers. When about forty he travelled with his disciples to the various princely courts then existing in China, preaching and teaching. His dialogues and exhortations concerning practical conduct, both public and private, were pub. by his disciples as the *Book of Meng-tseu*. See also CHINA, Chinese Literature. See S. Julien, Lat. trans., 1824-29; J. Collie (Eng.), 1828; J. Legge, *Chinese Classics*, 1862, 1875; E. Faber, *The Mind of Mencius*, 1882; and H. Giles, *History of Chinese Literature*, 1901.

Mencken, Henry Louis, Amer. critic, b. at Baltimore, Maryland, 1880. He began work on Baltimore newspapers, and then joined the staff of the magazine *Smart Set* as its literary critic. For some years he was joint editor of this pub. with George Jean Nathan. Together with Nathan he founded the *American Mercury* in 1924. M. has gained a wide reputation in the U.S.A. as a critic for the sophisticated. He has championed many an able native or foreign author. Most of his best essays have been reproduced in book form in a series under the general title of *Prejudices* (1919 ff.). In *Americana* (1925) his purpose is to show up the average man from the small tns. Other pubs. include criticisms of G. B. Shaw's plays, the philosophy of Nietzsche, and the works of Ibsen, Briony, and other playwrights. Some later works include *The American Language* (1919) and two *Supplements* (1945, 1948); *Happy Days*, 1880-1892 (1910); *Newspaper Days* (1941); *Heathen Days* (1913); and the auto-biographical, *The Days of H. L. Mencken* (1947). Part-author of *A New Dictionary of Quotations* (1941). See B. De Cussere, *Mencken and Shaw*, 1939.

Mende, cap. of dept. of Lozère, France, 63 m. N.W. of Nîmes, on the l. b. of the Lot. It has a fourteenth-century cathedral, built by Urban V. Pop. 6100.

Mendel, Johann Gregor (1822-84), Austrian biologist, b. at Heinzendorf of peasant stock. Having taken a degree at the univ. of Vienna he joined the Augustinian order at Brünn (Brno), where he taught natural physics in the monastic school and eventually became abbot. It was here too that M. made those observations upon which was based his famous theory propounded in 1866 and known to-day as Mendelism (q.v.).

Mendelism, biological theory of heredity first propounded by the Abbé J. G. Mendel (q.v.). At Mendel's death his immensely valuable contribution to the science of heredity had received no recognition; and it was principally owing to the trans. of his monograph by Prof. Wm. Bateson in 1902 that its scientific possibilities were realised and developed. Mendel was evidently well informed in many branches of contemporary biology. In his little garden he spent

much time cultivating the edible and the sweet pea, and kept exact records of various features of about 10,000 plants which he had grown. The possibility grew upon him that there must be some natural law of inheritance. He found that where the parents showed a marked difference in special characters, e.g. tallness and dwarfness, the hybrid offspring in the first generation was always tall. This prepotency, as Darwin and others had called it, he termed a dominant characteristic and the other recessive. In the next generation, produced either by self-fertilisation or by breeding hybrid with hybrid, he found that a form resulted in which the dominant characteristic occurred pure, while there was also one in which the recessive character was pure. These two occurred approximately as two in four, the other two, though exhibiting the dominant character, having the recessive one latent, as evidently was the case with the first filial generation (see HEREDITY, Fig. 2). That is to say, breeders have only to ascertain which characters that they wish to preserve are dominant and which recessive to be able to fix them permanently. Naturally, the breeding operations are hardly ever so simple, as other characters may assert themselves and may have to be bred out. But where formerly breeders were compelled to work almost in the dark, Mendel's law gives them at any rate a sense of direction, and there can be no doubt that the law ranks among the greatest of scientific discoveries.

Mendel's success in obtaining results enabling him to formulate laws of heredity was due to his recognition of the necessity for quantitative experiments with very large numbers of plants, and for experiments with easily recognisable characteristics. After dealing with single pairs of characteristics such as tallness and dwarfness, yellow seeds and green seeds, round peas and wrinkled peas, he formulated his 'first law,' or the 'law of the purity of the gametes,' which states that any gamete, i.e. reproductive cell, male or female, can carry the determinant (gene) of only one of a pair of alternative characteristics (see HEREDITY). Mendel next experimented with the inheritance of two pairs of characteristics, crossing, for example, a tall yellow-seeded plant with a dwarf green-seeded one. As a result, he discovered his second law, the law of free assortment. According to this, characteristics were assorted independently, and thus tallness or dwarfness might be associated with either green or yellow seeds. The result in the F₂ (second filial generation) would be tall yellow, dwarf yellow, tall green, dwarf green, in the ratio 9 : 3 : 3 : 1. More recent workers found numerous exceptions to this second law, and have proved the transmission of certain characteristics in groups, such 'linked' characteristics rarely being separable. In the pea there are seven such groups (corresponding to seven pairs of chromosomes) and Mendel unwittingly selected for experiment characteristics of different groups, so arriving at the conclusion that free assortment always

occurred. We now know that this is possible only when the characteristics concerned are in different groups (*i.e.* when their respective 'genes' are situated in different pairs of chromosomes). Examples of 'sex linkage' are known, as described in HEREDITY. In Mendel's material the characteristics under observation were definitely dominant or recessive, but dominance is not essential to Mendelian inheritance. Red flowers of the Jap. 'four o'clock' (*Mirabilis jalapa*) crossed with white ones, produce pink-flowered plants. These, intercrossed, yield plants with red, pink, and white flowers in the Mendelian ratio 1 : 2 : 1. Other disturbances of the Mendelian ratio are caused by lethal factors inhibiting the development of characteristics, and by the interchange, or 'crossing over,' of determinants of different groups (see HEREDITY). Knowledge of Mendelian inheritance has been of great economic importance in both plant and animal breeding. Animals immune to certain forms of disease, birds with increased egg-laying capacity, good milk cows, wheats immune to rusts, grain with good food reserves, are amongst the results due to selective breeding according to Mendelian laws. See R. C. Punnett, *Mendelism*, 1905; J. Wilson, *A Manual of Mendelism*, 1929; E. Baur, *Human Heredity*, 1931; G. C. Hurst, *Heredity and Ascent of Man*, 1935; and C. E. Walker, *Evolution and Heredity*, 1936.

Mendeléev, Dmitri Ivanovich (1834-1907), Russian chemist, b. at Tobolsk in Siberia, was educated at St. Petersburg, and was a pupil of Wurtz in Paris. After lecturing at Simferopol, Odessa, and St. Petersburg, he became prof. of chem. at the univ. there (1866-1890). His contributions to chemical philosophy and physical chem. were especially valuable. M. discovered and enunciated the periodic law of the atomic weights (1869), which was partly foreshadowed by others but brought to its highest perfection by him (see ATOMIC THEORY). His prediction of new elements such as eka-boron, eka-silicon, and dvi-manganese was subsequently realised in the discovery of scandium, germanium, and rhenium respectively. He made a careful study of the chemical properties of petroleum in the mines of Pennsylvania and Caucasus, and performed valuable work on the subjects of the liquefaction of gases (1884). In 1893 he became director of the Bureau of Weights. His chief work is *The Principles of Chemistry* (1868-70; Eng. trans. 1892). See T. E. Thorpe, *Essays in Historical Chemistry*, 1911.

Mendelssohn, Moses (1729-86), Ger. philanthropist and eclectic philosopher of Jewish descent, grandfather of the musician, was b. at Dessau on the Elbe. He endured great poverty in early life, and was largely self-educated. In 1750 he entered the service of I. Bernhard, a wealthy silk merchant, becoming his book-keeper, and finally his partner. He worked as a critic for Nicolai's (*q.v.*) *Bibliothek* which he helped to found. In 1754 he was introduced to Lessing, whose inti-

mato friend he became, collaborating with him in the satire *Pope ein Metaphysiker* (1755). He also wrote for Lessing and Nicolai's *Briefe, die neueste Literatur betreffend*. Lessing pub. M.'s *Philosophische Gespräche* anonymously (1755), and made M. the hero of his *Nathan*. From about 1767 M. turned his attention to the moral and political elevation of his race, becoming the foremost champion of Jewish emancipation in the eighteenth century. He made a Ger. trans. of the Pentateuch and other parts of the Bible (1783), pub. a Ger. version of Manasseh ben Israel's *Vindiciae Judeorum*, and wrote *Jerusalem* (1783, Eng. trans. 1838, 1852), a plea for freedom of conscience and a demand for the total separation of Church and State. Other works were *Über die Eridenz in den metaphysischen Wissenschaften* (1764, Berlin Academy prize); *Phádon* (in support of immortality of the soul, 1767; Eng. trans. 1789); *Morgenstunden*, in refutation of Pantheism and Spinozism and in defence of Lessing (1785-1786). See G. B. Mendelssohn's ed. of his *Werke*, 1843-45; and M. Brasch's ed., 1880; Lives by M. Samuels, 1825; M. Schwab, 1868; M. Keyserling, 1887; and F. Bamberger, 1929. See also G. Kanngießer, *Moses Mendelssohn*, 1868; S. Hensel, *Die Familie Mendelssohn* (Eng. trans.), 1881; I. H. Ritter, *Mendelssohn und Lessing* (2nd ed.), 1886; J. E. Erdmann, *History of Philosophy*, 1889, 1921; L. Goldstein, *Mendelssohn und die deutsche Aesthetik*, 1900; H. Höftding, *History of Modern Philosophy*, 1924.

Mendelssohn-Bartholdy, Jakob Ludwig Felix (1809-47), Ger. composer, b. in Hamburg, grandson of Moses M., the philosopher. He was baptised and educated as a Christian, his father adding the surname Bartholdy to the family name. His youth was spent in the refined surroundings of a family that enjoyed the advantages of very considerable wealth, culture, and brilliant social connections. With good looks, charm, and undoubtedly genius, success came to M. from the very beginning of his career; and from his grandfather he inherited his great capacity for work and the vitality that runs through much of his music, the violin concerto, for instance, like a flame.

He benefited by the tuition and advice of Berger, Zelter, Weber, Cherubini, and Moscheles, and by the time he was twenty had already produced his famous octet, three piano quartets, two sonatas, two symphonies, and the *Midsummer Night's Dream* overture, besides a host of songs, an opera and many short pieces. The next few years were passed in visiting London, Munich, Vienna, and Rome, and in incidental tours in Scotland, Italy, and Switzerland (1828-31); he met with an eager welcome everywhere, and achieved a wide fame as pianist, composer, and conductor. The *Hebrides* (*Fingal's Cave*) overture was composed in 1830 (revised 1832). In 1837 he became conductor of the celebrated Leipzig Gewandhaus orchestra, and two years later married Cécile Jeanrenaud at Frankfort. The same year saw the production of his 42nd

Psalm, and the next year his splendid violin concerto was written, and *Lobgesang* in 1840. He had already conducted sev. of the Cologne and Dusseldorf festivals, and on his Eng. tour in 1846 he produced his *Elijah*, still one of the world's favourite oratorios, at Birmingham.

Everything seemed bright in the horoscope of M.'s future days. He was happily married with five children, and money was coming in for his work, apart from his private income. But the rift in the lute was his health. He hastened from place to place, conducting, giving organ recitals, playing at benefit concerts for less fortunate musicians. A series of concerts for the Philharmonic Society in London, where he introduced one of the *Leonora*



MENDELSSOHN

overtures, strained him beyond endurance. His unalloyed success in fact followed him to the grave. He returned home only to fall ill and die before his fortieth year. A special train took the coffin to Berlin, and a torchlight procession bore him to the burying-place. There were services and memorial performances throughout Germany. In London *Elijah* was given in a hall hung with mourning. But then a reaction set in. M.'s sentimentality, excessive facility, and superficial effects for a time overshadowed his genius, the genius of a composer of lofty ideals, who achieved a consummate artistry in every form of music except opera, and who had an immense influence on his age. The pendulum has swung fairly in these days. His violin concerto, considered perfect of its kind, is continually played. *Elijah*, if too dramatic for the concert stage and not dramatic enough for the theatre, is often given, sometimes in costume. The *Dream*, with its vitality, is ever young. Of the symphonies, the *Scotch* and the *Italian* remain

to be often enjoyed by simple audiences; and the benediction of what is popularly called 'Mendelssohn's Wedding March' is familiar enough.

M.'s music, if not always great, is invariably charming, and much adverse criticism is attributable to the fact that his inferior works (e.g. songs and piano solos), are best known, whilst his finest efforts (e.g. chamber-music) are somewhat neglected. As a technician M. was first-rate. His *Dream* music, in particular, is admirably scored, with the instruments playing in a light individual way that was then quite novel. His command of form was equal if not superior to that of both Schumann and Schubert. His success and his failure lay in one and the same fact, that he did nothing new, save in details. He was no innovator, no philosopher; but his contribution to the delight of music is unquestioned. See lives by E. Wolff, 1906; I. Moscheles (Eng. trans.), 1873; S. Stratton, 1901, 1934; W. Dahms, 1919; and Letters, ed. by G. Seiden-Goth, 1916. See also R. B. Gotch, *Mendelssohn and his Friends in Kensington*, 1931, and J. Petit-pierre, *The Romance of the Mendelssohns*, 1948.

Menden, tu. of Westphalia, Germany, 16 m. E.S.E. of Dortmund. The chief manufus. are articles of tin and sheet-brass. Pop. 12,000.

Mendès, Catulle (1841-1909), Fr. poet, novelist, and playwright, b. at Bordeaux, was one of the group of 'Parnassians.' He founded *La Revue Parnassiste* (about 1859), his *Roman d'une nuit* (for which he was fined and imprisoned) appearing in it (1861). His poems include *Philomèle* (1863); *Poésies* (1870, 1885, 1892); *Hespérus* (1872); *La Grive des vignes* (1895). He wrote plays, novels, and criticism also, such as *Justice* (1877); *Wagner* (1886); *Méphistophéla* (1890); *L'Art au théâtre* (1896-1900); *Fiammetta* (1898); *Le Mouvement poétique français de 1867 à 1900* (1903); *Ariane, Gladigny* (1906); and *La Maison de la vieille* (1894). See study by A. Bertrand, 1908; and M. Sourian, *Histoire de Parnasse*, 1929.

Mendicancy. In law M. is synonymous with begging. Begging *per se* is no more illegal than betting; what the law punishes is not so much begging as the habit of M., or begging in a certain way, or in a public place. In classical times beggars would seem almost to have formed a legally recognised class of persons enjoying, as it were, a stereotyped place in the social system. Many Lat. writers, for example, record the daily congregations of beggars in the porches of the houses of the wealthy, and give to the modern mind the impression that the larger the number the greater the credit to the particular plutocrat favoured with the attentions of these strange 'clients.' Juvenal, too, in *Satires* iv. and v., speaks of the crowds of mendicants who, without interference by the law, habitually took their stand on bridges, or frequented the road leading to Acria or other suburban arteries, invariably bearing with them their *tegetes* or sleeping mats. Under the Vagrancy Act, 1824, the law punishes, as a rogue and

vagabond, any one who (1) *habitually* goes about as a collector of alms, or (2) endeavours, by fraudulent pretences, to procure charitable contributions. Obtaining money by sending a lying begging letter is punishable under the Larceny Act, 1861. Standing in public streets in order to beg alms is also punishable under the Vagrancy Act. See also MALINGERING. See F. Gray, *The Tramp*, 1931.

Mendicant Orders (Lat. *mendicare*, to beg), certain religious associations of friars that sprang up in the Church in the early thirteenth century, the Dominicans, Carmelites, and Franciscans being among the most noted. They practised the strictest self-denial and self-humiliation, owned no land or personal wealth, and subsisted mainly upon alms. Particulars about the M. O. will be found in the article on MONASTICISM and under the various orders. See also DOMINIC; ST.; CAPUCHINS; CARMELITES; FRANCISCANS; FRIAR. See E. Gebbett, *Italie mystique*, 1899, and Fr. Cuthbert in *The Friars and how they came to England*, 1903.

Mendip Hills, range in Somersetshire, England, extending from near Wells and Shepton Mallet towards the Bristol Channel, in the direction of Weston-super-Mare, for a distance of about 18 m. The highest point is Blackdown, 1067 ft., and the range includes the Cheddar Cliffs. The hills are mainly composed of carboniferous limestone, with eruptive rocks at intervals. Zinc ore and lead are mined.

Mendoza, Diego Hurtado de, see HURTADO DE MENDOZA, DIEGO.

Mendoza, Iñigo López de, Marquis of Santillana, see SANTILLANA, INIGO LOPEZ DE MENDOZA, MARQUIS DE.

Mendoza, Pedro González de (1428-95), son of Iñigo López, surnamed Grand Cardinal of Spain. He attained eminence under Henry IV. of Castile, by whose influence he was made a cardinal, and subsequently exercised equal influence over Isabella, whose right to the succession he espoused. He was successively bishop of Calahorra and Sigüenza (1473), chancellor of Castile and Leon, archbishop of Seville and Toledo (1481), and was sometimes called the third king of Spain. His influence was exerted in favour of the Jews, and of the projects of Columbus. He took a vigorous part in the prosecution of the wars against the Moors. The college of Santa Cruz at Valladolid was founded by him. On his death-bed he named as his successor Cardinal Ximenez. See Wm. H. Prescott, *History of Ferdinand and Isabella*, 1838.

Mendoza: 1. Prov. of W. Argentina, covering an area of 57,445 sq. m. The Andes form its W. boundary, and the Cordillera chain covers a good part of the ter. It has a dry climate. Minerals, such as gold and copper, abound, and copper and silver are extracted in large quantities. Uranium was discovered in 1947 at Las Heras. Marble, gypsum, and rock crystal are also mined, and there are petroleum deposits. The chief source of wealth is agriculture, the prin. products consisting of wheat, maize, wine, tobacco, and vegetables. Irrigation has turned

this arid prov. into one of wealth and prosperity. Pop. 590,600. 2. City of Argentina and cap. of above prov., 632 m. W.N.W. of Buenos Aires, with an elevation of 2320 ft. In 1861 all its prin. buildings were destroyed by an earthquake and now most of them are only one storey high. The climate is hot and dry. The chief exports are raisins and wine. In 1910 a tunnel through the Andes was completed, and M. is now the centre of a trans-continental route from Buenos Aires to Vulparaiso. Pop. 103,900.

Menedemus (c. 350-c. 276 B.C.), Gk. philosopher of Eretria, which gave its name to his school. Having been in turn a tent-maker and a soldier, he is said to have met Phœdo. He abandoned the military life, and became a student of Phœdo, whose academy he subsequently transferred to Eretria. Having taken an active part in the affairs of his city, he fell into disfavour through his intrigues with Antigonus Gonatas, at whose court he is supposed to have died of grief.

Menelaus, in Gk. mythology, was the son of Atreus or Plisithenos, and younger brother of Agamemnon. He was king of Lacedæmon and husband of Helen, of whom Paris robbed him, together with his treasures. He organised an expedition for her recovery, and with Agamemnon was one of the heroes of the Trojan war. On his voyage home he was shipwrecked off Cape Malea, and, after eight years spent among the people of the E., finally landed at Pharos. Here the god Proteus revealed to him the reason of his detention, and prophesied that as husband of the daughter of Zeus he would enter the Elysian plains alive. Having sacrificed to the gods, he resumed his journey and arrived at Sparta on the very day on which Orestes was holding the funeral feast over Agisthus and Clytemnestra. He spent the rest of his life quietly with Helen, by whom he was the father of Hermione and Megapenthes, the former of whom married Neoptolemus, son of Achilles.

Menelik, or Menelek, II. (c. 1842-1913), emperor of Abyssinia, was the son of Haelli Mellicoth, king of Shoa. In 1856 he was obliged to wed Bafana, the daughter of Theodore, the reigning emperor, and ten years later he became king of Shoa. On the assassination of Theodore in 1889 he declared himself emperor. Having inflicted an ignominious defeat on the It. at Adowa in 1896, he was able to replace the objectionable treaty of Uchali (1889) by the peace of Adis-Ababa (1896), whereby his independence was fully recognised. Under his intelligent direction Abyssinia rapidly assimilated W. civilisation.

Menemen, tn. of Asia Minor on the Gediz-chal, 14 m. N. by W. of Smyrna. Pop. 12,000; about half are Mohammedans.

Menéndez y Pelayo, Marcelino (1856-1912), Sp. writer and critic, b. at Santander, studied at Madrid, and after a brilliant academic career became prof. at the age of twenty-two. His orthodoxy and ultramontanism are revealed in his popular essays *La Ciencia española* (1878)

and in his *Historia de los heterodoxos españoles* (1880-86), whilst his *Calderón y su teatro* (1881) and his *Historia de las ideas estéticas en España* (1883-91, 1903-1912) are true monuments of literary criticism. He has issued the standard ed. of Lope de Vega (1890-1902). His complete works were pub. in 13 vols., 1911-1924 and 1940 ff. See lives by A. Bonilla, 1914; M. Artigas, 1927, 1939 (with bibliography); and A. Sandoval, 1944.

Menes (Mēnēs), according to the traditions of the Egyptians, was the first king of Egypt. The name, signifying conductor, has been found on inscriptions, but no contemporary monuments of him were known until his grave was discovered by de Morgan at Negadri in Upper Egypt in 1897. Herodotus ascribes to him the building of Memphis, and Diodorus says that he introduced the worship of the gods and the practice of sacrifices into Egypt.

Menfi, tn. of Sicily in the prov. of Girengi, 32 m. E.S.E. of Marsala. Pop. 12,000.

Menger, Karl (1840-1921), Austrian economist; prof. at Vienna, 1873-1903. Rejecting the historical method in economics, showing always an uncompromising preference for speculation and *a priori* theory, he is remembered particularly as a co-founder of the school of 'marginal utility' (the utility or importance to the buyer of the least important or 'marginal' part of his current consumption of any commodity), in opposition to the conventional explanations of values in form of costs without relation to the choices and preferences of consumers.

Meng-ka, see BANKA.

Mengo, dist. of Uganda. It contains the prin. residence of the *kabaka* (or king) of Uganda, and the seat of the native gov. of Baganda (or Buganda), as well as the headquarters of the prov. administration (Kampala). It is therefore regarded as the central dist. of the Buganda Prov. (see also KAMPALA). The pop. (1931 census) was 362,666 (natives 356,781; Indians 4512; Europeans 786; and Goans 475). Area 9376 sq. m. (land and swamp 5781; open water 3595 sq. m.). There is elephant hunting in the dist., and the bush-pig is found in thousands in the swamp and dense cover in the vicinity of cultivation. The M. Church Council was organised by the pioneer missionary A. Mackay in 1885, and evolved with the native Anglican Church of Uganda (constituted 1909). The M. hospital was founded in 1897. It adjoins the cathedral precincts at Namirembe (dedicated Sept. 13, 1919). The cathedral is an imposing red-brick structure, which was built at a cost of £28,000. It is the fourth cathedral on the site. The first, built of palm poles and grass, was blown down in a storm (1894). The second, of similar construction, was dismantled as unsafe (1901). The third, of burnt brick, and grass roof, was destroyed by lightning (1910).

Menga, Anton Raphael (1728-79), Bohemian painter, b. at Aussig. He was appointed court painter in Dresden, but was allowed to return to Rome to continue his studies. He soon earned a great

reputation by his original compositions, among them a 'Holy Family,' the Virgin of which was painted from a beautiful peasant girl whom he afterwards married. His 'Apollo and the Muses,' in the Villa Albani, Rome, made him still more celebrated. He executed various paintings for Charles III. of Spain, decorating the royal palaces of Spain, and the 'Apotheosis of Trajan,' at Madrid, is considered his masterpiece. See K. Gersenberg, *Winckelmann und Anton Raphael Mengs*, 1929.

Mengtsze, former treaty port in the S.E. of Yunnan, China, opened to trade with Tongking in 1886. Zinc, lead, tin, opium, and tea are exported. Pop. 193,000.

Menguaid, see MAIDSTONE.

Menhaden, **Hardhead**, or **Moss-banker** (*Brevoortia tyrannus*), important fish allied to the shads, common on the Atlantic coast of N. America. It is employed as a bait, but is chiefly valuable for its rich oil and for the manurial value of the residue.

Menhirs (Breton, *men*, stone; *hir*, long) are single, tall, upright standing stones, often known simply as monoliths. Some are of natural origin (Buck Stone, Staunton); many mark the sites of prehistoric burials; while others are boundary marks, meeting-places, or sacred sites. They are of various ages, are distributed geographically in Europe, Asia, and Africa, and in general give no indication whatever of their purpose. The menhir is the simplest form of megalithic monument, and a great number in the Brit. Isles probably belong to the late Neolithic or Early Bronze Age, and certainly to a megalithic culture. The M. at Carnac in Brittany (Early Bronze Age) are especially well known; one is about 30 ft. high. In the Morbihan are pieces of a menhir which was nearly 70 ft. high. Occasionally M. bear rough engravings of conventional human and animal forms; some are of obvious phallic significance.

Ménier, Emile Justin (1826-81), Fr. manufacturer and political economist, b. in Paris. He gave up the drug factory he had inherited from his father in 1864, and purchased cocoa plantations in Nicaragua and beet-fields in France, whereby he was able to manuf. chocolate on an immense scale. He pub. sev. treatises on economics, and served the Republican cause in Parliament (1876-81). Anticosti Is. in the St. Lawrence, Canada, was purchased by his son, and utilised as a game preserve.

Ménière's Disease, condition of middle age, in which vertigo, headache, deafness, and *tinnitus* (i.e. ringing in the ears) are associated in sudden attacks, due to hemorrhage into the internal ear or labyrinth. Other symptoms include vomiting and a staggering gait. While the vertigo may pass away or, at least, become reduced, permanent deafness may result. Though the disease was first described fifty years ago, there is as yet no satisfactory treatment, though relief may be obtained by bromide, phenol barbitone, and the salicylates.

Menin (Flem. Meenen), city in the prov. of W. Flanders, Belgium, 7 m. S.W. by W. of Courtrai. It is situated on the

R. Lys, close to the Fr. border. It is engaged in agriculture and manufs. of tobacco, chicory, and soap. There are also weaving mills, bleach-works, and iron foundries. Pop. 22,000.

Menin Gate, a handsome memorial to the 56,000 men of the Brit. armies who died or were killed in the Ypres salient during the First World War. The memorial was unveiled by F.M. Lord Plumer on Sunday, July 24, 1927, in the presence of an enormous assembly of Brit., Belgian, and Fr. representatives, including the king of the Belgians. In appearance it resembles a Rom. triumphal arch. The architect was Sir Reginald Blomfield, R.A., and the sculptor Mr. (later Sir Wm.) Reid Dick, R.A. During the First World War the Menin Road was a constant target for Ger. artillery and the old M. G. was soon reduced to ruins. Lord Plumer commanded the armies in this area, known as 'the most dangerous corner in Europe.' It is doubtful if any one spot in all the theatres of war became more widely known than the M. G. Almost every regiment of the Brit. Empire had, at some time during the war, marched through this place. The Ger. Army attacked in great masses down the Menin Road in 1914, and from the old M. G. the 'old contemptible' Brit. Army emerged to stem the flood of hostile invasion, in which task it was nearly annihilated.

On May 27, 1940, the day before the surrender of King Leopold, Ger. military cyclists passed through the M. G. in advance of tanks and motorised infantry.

Meningitis, inflammation of the membranes of the brain or spinal cord. Tubercular cerebral M., or acute hydrocephalus, is always associated with a tuberculous hist. It usually attacks children under ten years of age, but is occasionally found to affect adults. The early symptoms are very indefinite. There is disturbed appetite and digestion; the patient is restless, but easily fatigued. Severe headaches and vomiting mark the more definite stage of the disease, and the patient gradually passes from an excitable state to a depressed condition. Light, which in the first stage is painful, becomes tolerable again. Squinting almost invariably appears in the eyes, and there may be drooping of the eyelid or even blindness. The pulse becomes slow, the patient sinks into a drowsy and almost insensible condition. Towards the end there may be a recurrence of the more excitable state, and the child may appear to be improving. The disease is almost invariably fatal, though treatment with streptomycin has recently given some promising results.

Cerebro-spinal fever, or epidemic cerebro-spinal M., is also known as spotted fever. It is an infectious disease, produced by *Diplococcus intracellularis* (Welchsohn), now known as *Menigococcus intracellularis*, and since 1905 has caused considerable mortality in Europe and America. Its onset is sudden; the patient has severe headache, and is seized with rigors and vomiting. Mus-

cular spasms ensue; there is general hyperaesthesia and feverish conditions. About the fourth day rashes appear of varying form and colour. The death-rate a few years ago was 70 per cent, but the adoption of Flexner's serum treatment caused a marked diminution, bringing the mortality down to 20 per cent or even lower. Serum treatment has now been completely replaced by sulphonamides, which are more efficacious even than penicillin, and recovery is the rule. The spread of M. is apparently due to the dissemination of bacteria from the nose and pharynx of healthy people who rarely contract the disease but may act as carriers. In this way the bacteria eventually reach susceptible subjects.

The exact causes of epidemic M. are not fully known, but the bacteria become much more virulent in favourable conditions. Gordon recognised four types of meningococcus, associated with differences in the form of M., and during the First World War he and his colleagues introduced four separate types of sera for use in appropriate cases, as well as a polyvalent serum combating all four types of the disease. M. may, however, be due to other organisms associated with the presence of inflammation, particularly in connection with pneumonia and influenza, and the use of sulphonamides has rendered grouping unnecessary. See D. Brinton, *Cerbrospinal Fever*, 1941.

Meningocele, protrusion of the meninges through their bony covering. The meninges are the membranes covering the brain and spinal cord, and if there be any defect in the skull or vertebral column, the meninges may protrude, forming a cyst filled with cerebro-spinal fluid.

Meninsky, Bernard (b. 1891), English painter, b. in Russia. He studied at the Slade School, London, and also in Liverpool and Paris. He has exhibited at various international exhibitions. The Tate Gallery has his 'Portrait of a Boy' and the Dublin Art Gallery his 'Mother and Child.' He was one of the Brit. official artists in the First World War. He is now teacher of drawing and painting at the Central School of Arts and Crafts and at Westminster School.

Menippus, of Gadara, Coele-Syria, fl. in the early third century B.C. Cynic and satirist, he undoubtedly exerted a paramount influence on many subsequent writers, yet his books have all perished, and his style may only be gleaned from the *Menippian Satires* of M. Terentius Varro, avowedly his imitator.

Menken, Adah Isaacs (1835-68), American actress and poetess, b. in New Orleans, daughter of a Sp. Jew. Her original name is variously given as Adelaide McCord and Dolores Adios Fuertes. In 1856 she married John Isaacs M., a Jew, and changed her name Adios to Adah. She is said to have been married at least four times, one of her husbands being R. H. Newell ('Orpheus C. Kerr'), while another was Heenan (the 'Benicia Boy'). Her first appearance was in 1848 as a dancer in her native city; but her star turn was in 1864 in London as Mazeppa,

to the success of which her handsome physique largely contributed. Also acted in Paris in *Les Pirates de la Savane*. Among her friends were Gautier, Dumas the elder, Dickens, to whom she dedicated her *Infelicia* (1868), Charles Reade, and Swinburne, whose poem *Dolores* (1864) was inspired by her. She died in Paris, a professed Jewess.

Mennonites, Protestant sect, who date their origin from a congregation which formed itself in Zürich in 1525. They refuse to bear arms or to take oaths. They acknowledge only the authority of the Bible, postpone baptism until after a confession of faith, and dislike all forms of church hierarchies. Their principles were adopted and preached by the devout and enlightened Menno Simons (1492-1559), whose name is preserved in their title. It was he who rebuked the Westphalian Anabaptists for their fanatical excesses, which were responsible for the carnage and other horrors in Munster (1534), and it was largely due to his influence that the sect spread to Germany and Holland. For many years the M. were the victims of persecution. In 1786 several colonies of Ger. M. found an asylum in S. Russia, where Catherine II. allowed them to practise their religion undisturbed. To-day the sect numbers some 250,000 members, a third of these being in the U.S.A. Dutch refugees founded a Mennonite community at Germantown in Pennsylvania as early as 1683, and since 1871 there have been large Mennonite settlements in Kansas and Minnesota. See J. H. Ottius, *Annales Anabaptistici*, 1872; C. H. van der Smitsen, *Kurzgefasste Geschichte der Mennoniten*, 1895; J. S. Hartzler and D. Kauffman, *Mennonite Church History*, 1905; C. Crahn, *Menno Simons*, 1936; and the *Mennonite Quarterly Review*.

Menologies, see HAGIOLOGY.

Menominee (so called from a now almost extinct Algonquin tribe of Indians), city of Michigan, U.S.A., the seat of M. co., one of the greatest lumber shipping ports in the U.S.A. There is extensive cheese manuf. in the dist., and M. is also a fishing centre. Pop. 10,000.

Menominee, Algonquin tribe of Indians who dwell in an assigned ter. near Green Bay, Wisconsin. Except in language, they are not unlike the Ojibwa. Their estimated number is about 1400.

Menomonie, city of Wisconsin, U.S.A., co. seat of Dunn co., on the Red Cedar R. 60 m. S.E. of St. Paul, Minnesota. It is an agric. centre; timber production was once important but has declined with the clearing of the pine forests. The Stout Institute trains teachers for vocational schools. Pop. 16,000.

Menopome (*Menopoma* or *Cryptobranchus alleghaniensis*), Mud Devil, or Hellbender, voracious four-legged tailed amphibian found in some of the rvs. of N. America. It is slate-coloured and about 2 ft. long, and the body is short and thick, and the head large, flat, and broad, with wide, fleshy lips. The neck has a single gill cleft on either side.

Menorca, see MINORCA.

Menorrhagia, see under MENSTRUATION. **Mensa**, one of Lacaille's S. constellations so named by him in 1752 after the Mons Mensae (Table Mt.) at the Cape of Good Hope. It lies between Dorado and the S. pole, and contains no star of a brighter magnitude than 5.3.

Mensheviki (Russian *menshivka*), minority wing of the Russian Social Democratic party, formed in 1903. It differed from the Bolsheviks or majority wing only on matters of party organisation, but later the two wings became mutually antagonised on tactics and aims. While the Bolsheviks (*q.v.*) were Marxists, the M. were 'reformist' in the continental sense and held that the socialisation of Russia should be gradually effected in co-operation with other radical groups and through economic reforms and the education of the masses. In the Provisional Gov. of 1917 of Prince Lvov, they had equal representation with the Socialist Revolutionaries. The Bolsheviks, who were then, and always had been despite their name, in the minority, were not represented. Later, the Bolsheviks repudiated political democracy altogether and organised themselves openly against the other two groups, eventually replacing the Provisional Gov. See further under BOLSHEVISM, and RUSSIA.

Menshikov, Alexander Danilovich (c. 1663-1729), Russian statesman and field-marshall, b. at Moscow. He began life by selling meat pies in the streets of Moscow, and had François Lefort, the tsar's favourite, to thank for his introduction to Peter the Great, with whom he had thoroughly ingratiated himself by 1699. As a soldier he distinguished himself at the siege of Azov (1696) and the battles of Kalisch and Poltava (1706, 1709). As a civil administrator he executed Peter's reforms with remarkable promptitude and success, and on his death assumed the reins of government during the brief rule of Catherine and the minority of Peter II. Ousted from power by the Dolgorukis, he was banished and d. an exile in Siberia.

Menshikov, Alexander Sergeyevich (1739-1869), Russian general and admiral, was the great-grandson of Alexander Danilovich M. He served Alexander in the Napoleonic campaigns of 1812-15, and in 1828 captured Anapa from the Turks. Created admiral in 1834, he improved very considerably the standard of efficiency in the navy. During the Crimean war (1854-56) he commanded the Russian forces at Alma, Inkerman, and around Sebastopol. Recalled on the breakdown of his health, he became a leader of the reactionary party in the Council of the Empire.

Menshiyah, El, or Minshat, El, tn. with archaeological remains, 11 m. N.N.W. of Girgeh, on the l. b. of the Nile in Upper Egypt. Pop. 8000.

Menstruation (Lat. *menstruus*, monthly, from *mensis*), also known as Catamenia, discharge of blood, usually from four to six oz., which issues every twenty-eight days from the uterus of a woman, so long as she is capable of procreation. M.

begins at the age of puberty, which among Teutonic races varies from fourteen to sixteen, and is a sign of the change from childhood to womanhood. The flow ceases between the ages of forty-five and fifty-two, this being a climacteric period popularly referred to as 'the change of life.' M. lasts as a rule from three to four days, and often occurs more or less frequently than once a month; during pregnancy and lactation it stops entirely, and its cessation, therefore, is an early indication of conception. M. comprises the discharge of the uterine lining, or endometrium, which has become thickened and vascular in preparation for the reception of a fertilised egg; it is thus part of the menstrual (oestrus) cycle.

The menstrual process is often accompanied by disorders, which are broadly classified as amenorrhoea, dysmenorrhoea, menorrhagia, and metrorrhagia. (1) Amenorrhoea implies absence or deficiency of catamenia. This may arise from such a physiological cause as pregnancy; from constitutional causes such as anaemia, malnutrition, emotional disturbance, malaria, and other febrile disorders, such diseases as phthisis, or diseases of the stomach or nervous system; or from local causes such as the absence, malformation, etc., or disease of the ovaries or uterus, or of both. Surgery will sometimes remove local causes, whilst anaemia and other constitutional causes may often be remedied by better nutrition, healthier surroundings, change of air or mental occupation. (2) In dysmenorrhoea, M. is attended by pain; with some women this is always so, whilst there are others to whom it brings no appreciable discomfort. The pelvis is the seat of the pain, but it is felt also in the groins, thighs, and sacrum. Other symptoms are headache and backache, and general lassitude. The various kinds of dysmenorrhoea are described as (a) ovarian; (b) congestive, or inflammatory; (c) obstructive, or mechanical; (d) membranous; and (e) neuralgic or spasmodic. Hot baths, rest in bed, drugs like phenacetin, hyoscyamus, and ammonium acetate; and especially purgatives and aperients administered a few days before catamenia is expected, may be recommended in certain cases. (3) Menorrhagia is flooding, or excessive flow. Frequent causes are subinvolution of the uterus, fibroid tumour, polypus, cancer, and ulceration of the cervix, etc. (4) Metrorrhagia is escape of blood from the uterus, independent of M.; it is occasioned by disease of the uterus or its appendages, and should be regarded as a serious sign.

Mensuration, section of geometry which investigates lengths, areas, and volumes. The lengths of ordinary straight lines are measured by mechanical means, but the measurement of irregular lines forms a part of the integral calculus, termed rectification. The areas of plane figures, such as the square, rectangle, etc., may be tabulated as follows: square = $(\text{side})^2$; rectangle = length \times breadth; parallelogram = base \times height; trapezium = $\frac{1}{2}h(a + b)$, where a and b are the lengths of the parallel sides, and h is the perpen-

dicular distance between them. Various formulae are true for the triangle: (1) half the base multiplied by the height, or (2)

$$\sqrt{s(s - a)(s - b)(s - c)},$$

where s = half the sum of the sides a , b , and c . For quadrilaterals, and the various types of polygons, it is usual to divide them up into triangles, find the area of each triangle, and sum up the results. The area of the circle = πr^2 , where $\pi \approx 3.141 \dots$ and r = radius. The area of a sector of a circle = $\pi r^2 \theta$, where θ is the angle subtended by the arc at the centre. That of the ellipse = πab , where a and b are the semi-axes. Various other formulae for the triangle and polygons are known in terms of trigonometrical notation. The areas of the less familiar areas are determined by calculation by means of the integral calculus.

With regard to solids, the volumes and surface areas of the most common are as follows: *Volumes*.—Prism = area of base \times height. Cone = $\frac{1}{3}$ area of base \times height. Pyramid = $\frac{1}{3}$ area of base \times height. Cylinder = area of base \times height. Sphere = $\frac{4}{3}\pi a^3$, where a = radius of the sphere. *Surface areas*.—Prism, cone, pyramid, and cylinder = area of ends $-$ area of sides. The surface area of the sphere = $4\pi a^2$, where a = radius. Various mechanical rules have been formulated for the areas, e.g. Simpson's rule. Pappus's theorem expresses the fact that the volume of a solid of revolution is equal to the area of the generating figure multiplied by the circumference of the circle through which its centre of gravity moves, and the surface area of a solid of revolution is equal to the perimeter of the generating figure multiplied by the distance through which the centre of gravity travels. Amongst the mechanical appliances, the planimeter may be mentioned as an instrument for the measurement of the area of an irregular plane surface.

Mental Deficiency Acts. The Mental Deficiency Act of 1913 (amended by the Mental Deficiency and Lunacy (Amendment) Act, 1919, and the Mental Deficiency Act, 1927) legislates for the care of idiots, imbeciles, feeble-minded persons, and moral imbeciles in institutions under the control of a Board of Commissioners. These institutions may receive mental defectives (a) on the request of a parent or others responsible for such persons, (b) on the issue of an order from the court made at the instance of any relative or friend or by an officer of the local authority. Under the Act transfers from institutions for mental defectives to lunatic asylums may take place and from the latter to the former. Children of seven years and upwards may be certified and instructed in special schools. Under the Medical Treatment Act, 1930, opportunity is afforded of treatment without certification of those suffering from mental illness. Any volunteer for treatment who makes a written application for the purpose may be received as a voluntary patient in an institution or a nursing home or place approved by the Court of Protection or into the charge of an approved

person without a reception order. Young people under sixteen may become voluntary patients provided their parents or guardians make a written application which should be accompanied by a recommendation from a doctor. Patients may leave those homes or institutions where they have been voluntarily admitted upon giving seventy-two hours' notice of an intention so to do. Notice of the reception, departure, or death of a voluntary patient must be sent to the Court of Protection. If a voluntary patient becomes incapable of expressing willingness or unwillingness to receive treatment, such patient may not be detained for more than twenty-eight days, unless steps have been taken to deal with him as of unsound mind. Commissioners have power to visit voluntary patients, and if they deem them unfit to be treated as such, may order their discharge or take steps to deal with them as persons of unsound mind. See also INSANITY.

Mental Tests. Modern psychologists use tests of intelligence, of educational attainments, of aptitudes (mechanical, musical, etc.), of the senses, and of personality and interests in studying children and adults. Such abilities or qualities are usually judged, in daily life, from casual observations of a person's behaviour when confronted with intellectual, mechanical, or other tasks. But a scientifically constructed test shows the following characteristics: (1) The problems or tasks are carefully chosen and graded and have usually been proved to measure the quality in question. (2) They often include a wide range of problems in order to cover the ground systematically and to allow scope for those who are highest and lowest in the quality. (3) They are given in a standard manner, often with a time limit, and should only be applied by testers who are trained both to get the co-operation of the people tested and to follow the exact procedure and interpret the results correctly. (4) Accurate records are made of the responses. Problems are set in such a way that there is only one correct answer to each; hence the marking is objective and unaffected by the tester's personal judgment. (5) Scores may be based on numbers of correct responses or the time taken, etc., and these are evaluated by comparison with the norms or standards of performance for children of the same age, or for groups of similar adults. For example, a dull child of ten years may only do as well on an intelligence or an arithmetic test as an average eight-year-old. He is then said to have a mental age or arithmetic age of eight, and his *Intelligence Quotient* or I.Q. is $8/10 \times 100 = 80$. The average I.Q. is 100; very bright children range from about 130 to 180, feeble-minded ones from about 70 down to less than 20. Adult test results are more often expressed by *percentiles*. Thus an army recruit would be regarded as high in mechanical ability if his score was better than that of 90 per cent of recruits.

The earliest tests, devised by nineteenth-century physiologists and psychologists,

including Fechner, Galton, Helmholtz, McK. Cattell, and others, were mostly for measuring the senses, for example, colour vision, auditory acuity and sense of pitch, and touch. Quickness of response or *reaction time* to light and sound, as measured by electrically operated chronometers, was found to differ widely in different individuals. Sir Francis Galton conceived the idea of measuring higher mental abilities, and studied different types of mental imagery. But the first intelligence tests were Ebbinghaus's completion test (1897) and Binet and Simon's scale (1905). The latter consisted of groups of short tasks appropriate for children of different ages. It has been trans., revised, and expanded in many countries, for example by Burt in England. The best-known versions are the Stanford-Binet (1916) and the Terman-Merrill scales. These are generally regarded as giving the most reliable measurement of a child's intelligence, e.g., before certification for a special school. Wechsler's Bellevue scale (1939) is more suitable among adults, and scales based mainly on play material such as the Merrill-Palmer are used with pre-school children. For deaf or other verbally handicapped children, practical or *performance tests* are available. These mostly involve fitting pictures or coloured blocks together, or putting shapes into holes.

Tests for measuring scholastic attainments in reading, spelling, arithmetic, handwriting, etc., were prepared by Thorndike and other Amer. psychologists early in this century. Valuable series of educational tests, which are especially useful in studying and coaching backward children, have been pub. by Sir Cyril Burt (*Mental and Scholastic Tests*, 1921) and F. J. Schonell (*Backwardness in the Basic Subjects*, 1942). This type of standardised examination was soon extended to the measurement of intelligence, and group tests consisting of series of printed problems were devised for Amer. recruits in 1917. Nearly 2,000,000 men took the army alpha (verbal) or army beta (non-verbal) tests. Many hundreds of tests along the same lines have been pub. since in Britain and America for measuring the intelligence or attainments of primary and secondary school pupils, ordinary adults, and university students. Tests of intelligence, Eng., and arithmetic are prepared yearly by Moray House, Edinburgh, and are used by many education authorities for selecting children at eleven years for grammar schools. Since 1942 all recruits to the navy, army, and R.A.F. have taken intelligence, educational, and other group tests, and the results have been shown to be highly relevant in allocation to specialist training, in selecting officers, etc. Though group tests are quicker and easier to give and score than individual ones, they vary considerably in merit, and are often less trustworthy.

Testing of occupational aptitudes has been fostered in Britain by the Industrial Health Research Board and the National Institute of Industrial Psychology. Mech-

anical tests based on pieces of apparatus or pictures and diagrams, and clerical tests, play a useful part in advising school-leavers about suitable subjects and in classifying recruits. In selecting workers for a particular job more specialised tests are constructed after a careful analysis of the job requirements. Interests in different types of work can be measured by questionnaire tests, but personal qualities such as leadership, dependability, and emotional stability are much more difficult to measure than abilities. They can be assessed only very inaccurately by questionnaires or in the ordinary interview. Ratings or judgments by acquaintances, and the extended practical exercises developed by the War Office and civil service selection boards, are of some value. So-called projection tests, where the person reveals his qualities indirectly through his responses to ink-blots, pictures, or verbal stimuli (free association), are often used by trained psychologists. See also under PSYCHOLOGY.

See Sir F. Galton, *Inquiries into Human Faculty and its Development*, 1883; M. S. Viteles, *Industrial Psychology*, 1932; O. Buros, *Mental Measurements Year Book*, 1933-36, 1938, 1946, 1948; R. B. Cattell, *A Guide to Mental Testing*, 1936; L. M. Terman and M. A. Merrill, *Measuring Intelligence*, 1937; P. E. Vernon, *The Measurement of Abilities*, 1940; J. E. Bell, *Projective Techniques*, 1947; II. J. Kyssenck, *Dimensions of Personality*, 1947; P. E. Vernon and J. B. Parry, *Personnel Selection in the British Forces*, 1949.

Mentana, vll. 12 m. N.E. of Rome, Italy, where in 1867 the Fr. and papal forces defeated Garibaldi. Pop. 3500.

Menteith, Lake of, loch and dist of Perthshire, Scotland, in the S.W. of the co. The loch is about 1½ m. long, with a breadth of 1 m., and contains three small picturesque islets. The dist. extends from the Teith to the Forth, and formerly was an independent stewartry. The earldom of M. is long extinct.

Mentha, name applied to a genus of labiate plants, otherwise known as the mints; also to the volatile oil contained by the different species. The more important species are *M. viridis*, or spearmint, which is used for culinary purposes, and contains an oil used as an aromatic stimulant; *M. piperita*, or peppermint, used to relieve nausea, flatulence, and pains in the stomach and intestines; and *M. sylvestris*, or horse mint, an uncultivated variety, used for the same purposes as spearmint and peppermint.

Menthol ($C_{10}H_{19}OH$), alcohol derivative of menthone, one of the constituents of oil of peppermint. It also occurs in a free state in peppermint, and is mainly responsible for the characteristic odour of the plant. M. crystallises in prisms which melt at 143° and boil at 212° C. It is reduced by hydroiodic acid to hexahydrocymene. The M. of pharmacy is commonly derived from *Mentha arvensis purpureascens*, a Jap. variety of mint. In this form it usually contains other ingredients, and is made up as a soft

crystalline solid resembling camphor. In fact, it is often known as mint camphor. It volatilises readily on being rubbed on the skin, but has a stimulating effect if evaporation is prevented. It is used as an anodyne in neuralgia and in many irritating affections of the skin.

Menthu, in Egyptian mythology, lord of Thebes and of the sky—a personification of solar heat and figured as guiding the boat of the sun and striking down Apepi, the lord of the powers of darkness, or personification of evil. M. was worshipped at Karuak, Hermontis, and other Theban cities, his cult being associated with that of Ra, the sun-god. He was renowned also as a god of war. The bull was sacred to him, and Bakha, the sacred bull of Hermontis, was supposed to be an incarnation of M., who is sometimes represented with a bull's head, though more usually with the head or double-head of a hawk surmounted by a solar disk.

Mentmore, vil. in Buckinghamshire, England, 4 m. from Leighton Buzzard. Here is the seat of the earl of Rosebery, once the property of the Rothschild family.

Menton (Fr. Menton), favourite winter and health resort, 143 m. by rail E.N.E. of Nice, on the Mediterranean shore, in the dept. of Alpes Maritimes, France. A rugged headland divides its bay into two porlions. There are really two settlements, that of the hotels and visitors, which hugs the water's edge, and the native quarters straggling up the mt. side. The mean ann. temp. is 61° F. The vegetation is almost tropical, and millions of lemons are grown each year.

In the Second World War allied forces landed near M. on Sept. 8, 1944, prior to a northward advance. Pop. 13,800.

Mentor, figures in Gk. legend and especially in Homer as the son of Alcimus, the trusted friend of Odysseus and the wise preceptor of Odysseus's son, Telemachus. It was he who had charge of Odysseus's home in Ithaca whilst the latter was abroad. From the part he plays in Fénelon's *Télémaque* his name has become synonymous with 'trustworthy counsellor.'

Menz, see MAINZ.

Mentzelia, genus of half-hardy annuals or perennials (family Loasaceae) with large white, yellow, or orange flowers. Sev. species are hardy in sunny borders.

Menuf, tn. 35 m. N.N.W. of Cairo, situated in the Nile delta at the junction of two branches in lower Egypt. It is an important market for agric. produce. Pop. 30,000.

Menufia, or **Menufiyah**, *mudiria* or prov., 607 sq. m. in area, in the Nile delta. Lower Egypt. It stretches from the fork of the main arms along the Rosetta branch. Pop. 1,159,700.

Menuhin, Yehudi (b. 1916), Amer. violinist of Jewish descent. He began his musical studies at the age of four under Sigmund Ankur and Louis Persinger in San Francisco, and later was a pupil of Georges Enesco at Paris. At the age of eleven, having already made numerous public appearances, he performed the

astonishing feat of playing the Beethoven concerto with the New York Symphony Orchestra under Fritz Busch. He made his Berlin and London débuts in 1929, and has since then played in all the principal cities of the world. M. is regarded as among the greatest exponents of his art.

Menyanthes, see BUCK-BEAN.

Menzel, Adolph Friedrich Erdmann von (1815-1905), Ger. painter and engraver. b. at Breslau. He lost both his parents before he was eight, and had later to support his family. Having illustrated Goethe's *Kunstlerische Erdenwaffen* and other works with pen-and-ink drawings, he revived the art of wood engraving, and made a name by his illustrations of Kugler's *Geschichte Friedrichs des Grossen*, and of the actual works of Frederick the Great (1843-49). He owed his mastery of oils purely to his own endeavours. 'The Forge,' 'The Ball Supper,' and 'The Market Place at Verona' are three of his best pictures. See J. Meier-Graefe, *Der junge Menzel*, 1906; and lived by J. von Kurenberg, 1935, and E. Waldmann, 1941.

Menzies, Robert Gordon (b. 1894), Australian statesman and lawyer, b. at Jeparit, Australia, son of James M., member of the legislative assembly, Victoria. Educated at state schools, Granville College, Ballarat, Wesley College, Melbourne, and Melbourne Univ., he was called to the Bar, 1918, and entered the Victorian Parliament in 1928. Attorney-general, minister of railways, and deputy premier of Victoria, 1932-34, and attorney-general of Australia, 1935-39. M. was elected leader of the United Australia party in April 1939, being Prime Minister and member of the advisory war council, 1939-41. That he stands for the unity and solidarity of the empire was shown by his decision in 1940 to send the Second Australian Imperial Force overseas, a decision over which he crossed swords with Curtin (q.v.), the leader of the Labour party. Throughout his tenure of office there was marked want of political stability in Australia, although all parties were agreed on the country's general war policy. M. tried to form a 'national' or composite gov. with the Country party, but the leader of that party, Dr. Earle Page, could not agree on the terms on which his party should join, and resigned. Labour, on the other hand, refused to join any coalition, and M. had no option but to resign when Curtin rejected his proposal to form an all-party gov. M. became Prime Minister of Australia in Dec. 1949 after the defeat of the Labour Gov.

Menzies, tn. in the gold-mining dist. of W. Australia. It lies S. of Lake Ballard, and is connected by rail with Malcolm, Albany, and Perth. Pop. 1900.

Menzini, Benedetto (1646-1704), It. poet, b. at Florence, entered the priesthood, becoming prof. of eloquence at the archigymnasium of Rome. He enjoyed the patronage of Christina of Sweden, and was in some measure inspired by Francesco Redi. His original verse, which includes twelve pungent satires (1728), some mediocre odes, and a few dainty anacreontics, is more readable to-day than

his somewhat antiquated essay in criticism entitled *Art of Poetry*.

Mepacrin, see under CINCHONA BARK ALKALOIDS.

Mephistopheles is the evil spirit in the Faust legend, by whom Faust is persuaded to sign away his soul. M. receives very different treatment at the hands of Marlowe and Goethe in their versions of the Faust legend. Both, however, identify him with Lucifer (q.v.), the fallen archangel, with the medieval devil, and also with the humorous kobold of Ger. folklore.

Meppel, tn. in Drente, Holland, 17 m. by rail N. by E. of Zwolle. It communicates with the Zuider Zee via the Meppeler Dijp. Pop. 12,100.

Mequinez, see MEKNES.

Merano (Ger. Meran), tn. and health resort, picturesquely situated 1050 ft. up at the base of the Küchelberg, on the Passer R., 16 m. N.W. of Bolzano, in the It. Tyrol. Pop. 10,000.

Merbeck, John, see MARBECK.

Mercantile Law. There is no part of the Eng. law which is specifically called M. L. except in text-books, although the phrase is occasionally to be found in the title of a statute, e.g. the Mercantile Law Amendment Act, 1850 (as to which see LIMITATIONS, STATUTES OF). The reason for this is that Eng. M. L., built largely upon the customs of merchants, in theory forms merely a part of the common law (q.v.), and that such codification as can be said to exist has been comparatively recent and confined to special topics, e.g. the Bills of Exchange Act, Merchant Shipping Acts, Sale of Goods Act, etc. For the sources of M. L., its rise and development in England, see under LAW MERCHANT. Other subjects bearing on M. L. are Agency, Sale of Goods, Partnership (q.v.), Negotiable Instruments (q.v.), and Bill of Exchange, Life Assurance, Fire, Marine, and Accident Insurance (see also INSURANCE), Common and other Carriers, Contracts of Suretyship (see GUARANTEE), Shipping (see MERCHANT SHIPPING ACTS), Bankruptcy (q.v.), Lien (q.v.), Mortgage (q.v.), Pawn (see PAWBROKER), and occasionally Joint Stock Companies (see under COMPANY LAW).

Mercantile Marine. From A.S. days the merchant seamen of Britain have made a vital contribution to national defence and commercial prosperity. The naval tradition has been for centuries a crucial factor in the life of the nation, though it developed slowly and irregularly. As far as seamen were concerned there was no contract lasting longer than a ship's commission and no security of re-employment until the middle of last century. But seamen congregated in the dockyard tns. and they lived by and manned the navy. It was only during the reign of Henry V. that the Eng. navy, as distinct from the merchant service, was estab., and it was only in that of Henry VIII. that the king estab. dockyards at Woolwich, Deptford, and Portsmouth, appointed a Board of Admiralty, placed the naval service on a distinct footing, and estab. Trinity House to encourage navigation. The dockyard tns. were estab. to control

the Channel approaches and to defend the mouth of the Thames. They were important military fortresses before the king developed his power upon the sea. The dockyards and the royal ships were, however, only one element of the king's marine forces; for over all vessels he possessed that indirect remote control which medieval theory gave, and for centuries certain tns. could be called upon to furnish their due quota of ships in times of stress. Hence there was always the closest contact between the royal and merchant navies. The navigators of royal ships came from merchant vessels and returned to them. The principle of the Royal Naval Reserve, 'in itself a Victorian creation designed to utilise the merchant service officers and men in time of war, is deep-rooted in all naval theory' (D. Mathew, *The Naval Heritage*, 1944). There is hardly an industry in the country that does not rely upon the merchant navy, and hardly a person whose prosperity and general well-being is not bound up in this vast and complicated organisation. It is a vital life-line without which this is, kingdom could not maintain its position in the van of world powers—without which, indeed, the people of the is. could not live (Sir Archibald Hurd, ed. *Britain's Merchant Navy*, 1943). The M. M. in Great Britain is controlled by the Ministry of Transport, which administers the laws and regulations dealing with it. On Tower Hill, London, there is a memorial to the 12,649 officers and men of the merchant service and fishing fleets who lost their lives in the First World War. For the work of the M. M. in the Second World War see under NAVAL OPERATIONS IN SECOND WORLD WAR. The training of a navigating officer usually takes place either partly in a recognised training ship or nautical training college, or by apprenticeship wholly at sea. In the former case training may begin at fourteen years of age, and continues until sixteen or seventeen. Evidence of a satisfactory standard of education is required on entry, and after a minimum period of two years' training a certificate is granted which exempts from one of the four years required for a second mate's certificate. The fees for this course vary, but range from £100 to £160 a year. In the case of apprenticeship, the apprentice continues his general education until he is sixteen, and he then applies to be an apprentice, either to the ship he has selected or to the Shipping Federation. No written examination is required. Some physical defects, especially defective eyesight, will disqualify a boy when he comes to take the second mate's certificate. The Ministry of Transport issues a model form of indenture for apprenticeship; and particulars of the examinations necessary for Ministry certificates during and after apprenticeship may be obtained from the Ministry of Transport Regulations (Examinations of Masters and Mates). Other details, such as rates of pay and prospects, are issued by the general secretary of the National Maritime Board. Most officers continue at sea for the whole of their pro-

fessional life, but there are some shore appointments with salaries ranging up to £1500 a year.

Officers and men of the M. M. made great sacrifices to duty in the Second as in the First World War. They displayed incomparable bravery in the face of U-boat and bomber attacks, and the story of the Brit. convoys to Russia and Malta and elsewhere is one of the war's true epics.

Mercantile Navy Losses in the Second World War.—Brit. merchant ships (excluding fishing vessels) lost by enemy action during the Second World War



Ministry of Transport
BRITISH MERCHANT NAVY BADGE

totaled 2426, with a gross tonnage of 11,331,933. Of these 1332 (7,595,645 gross tonnage) were destroyed by U-boats; 296 (816,255 gross tonnage) by mines; 209 (969,087 gross tonnage) by surface craft; 383 (1,575,230 gross tonnage) by aircraft; and 206 (375,716 gross tonnage) by other or unknown causes. The heaviest losses were in 1941, when 717 ships (2,824,056 gross tonnage) were sunk: 291 by U-boats, 172 by aircraft, 76 by mines, 70 by surface craft, and 103 by other or unknown causes. Total losses in other years of the war were: 1939, 96 ships (419,015 gross tonnage); 1940, 548 ships (2,435,667 gross tonnage); 1942, 646 ships (3,459,923 gross tonnage); 1943, 273 ships (1,514,221 gross tonnage); 1944, 103 ships (489,040 gross tonnage); 1945, 43 ships (190,011 gross tonnage). In addition 136 fishing vessels of 24,525 tons were lost, the highest total, 55, being destroyed in 1941. The main differences in merchant ship losses caused by U-boats in the First and Second World Wars were in the rate of loss and in the average size of ships sunk. In the First World War losses averaged nearly 95 ships a month compared with 41 a month in the Second. The average tonnage sunk a month in both wars was approximately the same at 215,000 gross tons, the average size of ships sunk between 1939 and 1945 being 5250 gross tons, as against 2300 gross tons in 1914-18. The difference in the rates of loss is the more remarkable as in the

Second World War U-boats had a far greater operational range, and from the outset were able to use bases and facilities which placed them in a favourable position. Besides this, from June 1940 Germany had Italy as a partner in Europe, who had more than 100 U-boats, and until Dec. 1941 Britain faced the onslaught alone. In 1914-18 Germany had the naval forces of practically the whole world against her, yet her U-boats sank merchant ships at more than double the monthly rate of 1939-45. One of the

main reasons for the lower rate was the use of the convoy system from the very beginning of the war. In the Second World War allied forces destroyed an average of 11½ boats a month; in the First World War the losses of Ger. submarines were estimated at 3½ a month.

The casualties amongst personnel of Brit. and Brit.-requisitioned ships, from 1939 to the end of the war were: deaths, 30,189; missing, 5264; wounded, 4402; internees, 5556; total, 45,411. See II. St. G. Saunders, *Valiant Voyaging*, 1918.

Statistics.—The following is an analysis showing the changes which have taken place since 1901 in the distribution of steam and motor tonnage between the prin. countries of the world.

Country	1901	1914	1929	1939	1941
Great Britain and Ireland .	50·2	41·6	30·2	26·1	22·4
United States (sea) .	4·2	4·5	16·6	13·0	33·5
Japan .	2·2	3·8	6·3	8·2	1·3
Norway .	3·4	4·3	4·9	7·1	5·3
Germany .	10·1	11·3	6·1	6·5	0·5
Italy .	2·7	3·1	4·8	5·0	2·6
France .	4·4	4·2	5·0	4·3	3·5
Holland .	2·1	3·2	4·4	4·3	3·4

The figures for Great Britain and Ireland in 1941 do not include Eire. The above table has been compiled by Lloyd's Register of Shipping from the entries in *Lloyd's Register Book*, which includes records of all sea-going merchant ships of 100 tons and upwards.

The following is an account of the net tonnage of vessels with cargo (including their repeated voyages) that entered or cleared in Brit. ports during the twelve months ended Dec. 31, 1948, compared with the corresponding period of twelve months ended Dec. 31, 1938, distinguishing (a) nationality of vessels and (b) trading area.

(a) Nationality	Entered		Cleared	
	1938	1948	1938	1948
British	38,908,668	34,673,151	34,510,881	25,642,195
	Tons	Tons	Tons	Tons
Soviet	413,826	81,509	217,606	84,524
Finnish	1,269,141	341,929	1,117,766	318,872
Swedish	2,217,257	2,225,126	1,781,192	1,146,874
Norwegian	4,309,081	2,904,732	2,634,015	1,154,479
Danish	2,167,214	1,152,084	2,108,448	881,933
German	4,626,039	90,304	4,076,745	168,220
Dutch	3,733,102	2,108,123	2,926,410	2,012,896
Belgian	1,449,496	978,174	1,365,180	897,164
French	2,452,187	858,847	3,687,606	964,522
Italian	458,513	177,022	508,600	73,316
Yugoslav	207,255	101,251	197,189	72,864
Greek	943,605	617,483	687,489	164,286
U.S.A. . . .	3,118,798	2,774,600	1,645,822	1,283,124
Panamanian	354,686	917,106	68,636	220,819
Japanese	342,836	—	189,795	—
Other Nationalities	1,400,388	553,119	1,157,873	679,422
Total Foreign	29,463,724	15,881,409	24,370,362	10,123,315
Total British and Foreign	68,372,392	50,554,560	58,881,216	35,765,510

(b) Trading Area		Entered			
		1938		1948	
		Total	Total	British Vessels	Foreign Vessels
		Tons	Tons	Tons	Tons
1 (a). Eire		3,819,101	2,536,796	2,409,043	127,753
(b). N. Europe (foreign)		18,788,035	10,740,573	4,119,555	6,621,018
2. Europe (Atlantic) and W. Mediterranean Countries		8,592,406	6,666,168	4,692,835	1,973,333
3. Central and E. Mediterranean Countries	:	2,266,095	2,237,356	1,565,283	672,073
4. W. and S. Africa . . .		1,721,504	2,636,253	2,295,707	340,546
5. E. Africa, Persian Gulf, India		4,398,625	4,428,020	3,563,920	864,100
6. E. Asia and Islands in the Pacific	:	2,584,935	1,081,328	872,225	209,703
7. Australasia		3,268,690	2,664,379	2,523,711	140,668
8. N. America—Atlantic Coast		13,879,759	9,136,087	6,655,002	2,481,085
9. W. Indies and Central America (Atlantic Coast)		4,286,737	4,894,630	3,097,784	1,796,846
10. S. America—Atlantic Coast		2,649,122	2,112,758	1,891,613	221,145
11. S. and Central America—Pacific Coast		482,284	177,138	172,758	4,380
12. N. America—Pacific Coast		1,468,782	1,089,536	783,670	305,866
13. Other Areas		166,317	152,938	30,045	122,893
Total British Countries . .		18,558,015	15,748,218	14,466,926	1,281,322
Total Foreign Countries . .		49,814,377	34,806,312	20,206,225	14,600,087
Total all Countries . . .		68,372,392	50,554,530	31,673,151	15,881,409
Cleared					
1 (a). Eire		4,512,866	3,238,863	3,163,620	75,213
(b). N. Europe (Foreign)		18,008,022	8,979,944	3,554,328	5,425,616
2. Europe (Atlantic) and W. Mediterranean Countries		9,615,032	5,377,601	3,883,241	1,494,360
3. Central and E. Mediterranean Countries	:	2,439,615	1,816,608	1,371,273	475,335
4. W. and S. Africa . . .		1,784,041	1,980,381	1,796,955	183,429
5. E. Africa, Persian Gulf, India		3,094,726	2,652,689	2,134,340	218,349
6. E. Asia and Islands in the Pacific	:	1,638,843	1,079,119	782,572	296,577
7. Australasia		1,830,403	1,654,604	1,645,844	8,760
8. N. America—Atlantic Coast		11,039,235	6,110,151	4,448,553	1,661,898
9. W. Indies and Central America (Atlantic Coast)		1,065,221	631,451	564,723	66,728
10. S. America—Atlantic Coast		3,143,479	1,836,120	1,654,958	181,462
11. S. and Central America—Pacific Coast		272,401	137,531	133,673	3,858
12. N. America—Pacific Coast		417,219	238,973	208,115	30,858
13. Other Areas		20,113	842	—	842
Total British Countries . .		14,965,059	11,936,830	11,672,957	263,873
Total Foreign Countries . .		43,916,187	23,828,680	13,969,238	9,859,412
Total all Countries . . .		58,881,246	35,765,510	25,612,195	10,123,315

Net tonnage of Brit. and of foreign vessels employed in the coasting trade that arrived and departed, with cargo, at ports in the United Kingdom during the twelve months ended Dec. 31, 1948, compared with the corresponding period of 1938.

Vessels employed	1938		1948	
	Arrived		Departed	
	Tons	Tons	Tons	Tons
General Coasting Trade:				
British	21,310,018		20,982,591	
Foreign	331,818		508,105	
Intercourse between Great Britain and N. Ireland:				
British	6,870,676		7,203,925	
Foreign	13,277		19,376	
British	28,180,694		28,186,516	
Foreign	345,095		527,481	
Total	28,525,789		28,713,997	
Departed				
General Coasting Trade:				
British	21,452,011		20,885,768	
Foreign	346,079		515,356	
Intercourse between Great Britain and N. Ireland:				
British	6,915,472		7,111,104	
Foreign	12,495		17,711	
British	28,367,183		27,996,872	
Foreign	358,571		533,067	
Total	28,726,057		28,529,939	

Mercantile System, or Commercial System, policy of estimating the wealth of a country by the amount of gold and silver it contained, and, inferentially, of placing artificial restraints on commerce to prevent money (*see CURRENCY and MONEY*) from going out of the country. Towards the end of the eighteenth century, when the policy obtained in England, heavy duties were put on the importation of Fr. wines and silks and other commodities, and generally importation was discouraged, while everything was done by bounties and otherwise to foster exports. Adam Smith, in countering the M. S., as it was officially expounded in Thomas Mun's book, *England's Treasure by Foreign Trade*, the title of which at that time had become a fundamental maxim in the political economy of all commercial countries (*see book iv. of the Wealth of Nations*), shows how deeply rooted was this theory of Eng. statesmen, by reference to the theory of its then foremost philosopher, Locke, that the great object of a nation's political economy ought to be the multiplication of the precious metals as 'the most solid and substantial part of its movable wealth.' From Adam Smith we learn that there

were some six prin. means by which the M. S. proposed to increase the aggregate amount of gold and silver in any country by turning the balance of trade in its favour. Two were restraints upon importation, and they were imposed either by high duties or by absolute prohibition: (1) Restraints upon the importation of such foreign goods for home consumption as could be produced at home. The Navigation Act, primarily aimed against the Dutch, was an especially gratuitous barrier to the economical supply of fish from a people who were not only the prin. fishers in Europe, but by reason of their proximity could supply England at a low cost of transportation. But even Adam Smith had to concede that the Navigation Act was eminently favourable to the development of Eng. shipping, whatever its effect on foreign commerce. (2) Restraints upon the importation of goods of almost all kinds from those particular countries with which the balance of trade was supposed to be disadvantageous. Adam Smith's lengthy arguments against this restraint may be summed up in his position that the balance of produce and consumption may be constantly in favour of a nation, though the balance of trade

(an expression used to denote the supposed loss from foreign trade through the amount of gold and silver exported, as measured by that part of the imports which had to be paid for in gold and silver) be against it, by reason of the fact that though its circulating coin may be fast going out of the country or replaced by paper money, its *real wealth*, the exchangeable value of the ann. produce of its lands and labour, may all the while be increasing in much greater proportion than its debts. Exportation was encouraged (a) by drawbacks (see CUSTOMS DUTIES) in favour of (1) home manuf., subject to duties on exportation, and (2) foreign durable goods imported for immediate re-exportation; (b) by bounties to foster new or developing manuf., such as were supposed to be especially meritorious; (c) by commercial treaties; (d) by the estab. of colonies in distant countries from the supposed advantage of compelling them to buy Eng. commodities in exchange for their own. The only exceptions to the M. S. were those required by the system itself. The materials and instruments of production were the subjects of a converse policy, designed to enable manufacturers to obtain the requisites of manuf., as cheaply as possible so as to sell cheaper and export more largely.

From a wider view the M. S., in that it aimed to expand Brit. shipping and production, may be regarded as the economic concomitant of nationalism. The reaction against a system which tried to restrict colonies to the provision of raw materials and the absorption of Brit. manuf., was one element in the Amer. revolt. The question of a favourable balance of trade has again risen to great prominence since the end of the Second World War, especially in regard to the excess of imports from over exports to America. See further under CURRENCY and MONEY; IMPORTS and EXPORTS; and PROTECTION. See A. W. Small, *The Cameralists*, 1909; A. E. Monroe, *Monetary Theory before Adam Smith*, 1923; B. Horrocks, *A Short History of Mercantilism*, 1925; J. Morini-Comby, *Mercantilisme et protectionnisme*, 1930; and J. Viner, *Studies in the Theory of International Trade*, 1937.

Mercaptans, substituted alcohols, commonly methyl or ethyl, the oxygen in the hydroxyl group being replaced by sulphur, e.g. C_2H_5SH , methyl M.

Mercator, Gerhard (whose real name was Gerhard Kremer) (1512-94), mathematician, b. in Rupelmonde in E. Flanders, but of Ger. extraction. He was early fascinated by geography, and, after enjoying the patronage of the Emperor Charles V., became in 1558 cosmographer to the duke of Jülich and Cleves. He originated the device of projecting the meridians on maps as equidistant parallel lines, and lats. as parallel straight lines at right angles to the meridians. His pub. works are *Nova et aucta orbis terrae descriptio ad usum navigantium* (1578) and *Atlas sive cosmographicae* (1591).

Mercator, Nicholas (whose real name was

Nicholas Kauffmann) (1640-87), Dan. mathematician. It was he who discovered an arithmetical means of determining the area of spaces between the hyperbola and its asymptote, and who availed himself of this discovery to draw up logarithmic tables.

Mercator's Projection, see under MAPS and PROJECTION.

Mered: 1. Co. seat of M. co., California, U.S.A., 110 m. S.E. of San Francisco. It has a large trade in all kinds of fruit and other products, a lumber mill, and fruit packing and canning plant. Pop. 10,100. 2. Riv. of California, U.S.A., a trib. of the San Joaquin, having a length of 160 m. It traverses the Yosemite valley, and has two falls, 600 and 350 ft. respectively.

Mercedes: 1. Tn. of Argentine, 61 m. by rail W. of Buenos Aires. It has steam mills, soap factories, etc. Pop. 30,700. 2. Cap. and health resort of the prov. of Soriano, Uruguay, on the Rio Negro, 20 m. E.S.E. of Fray Bentos. Pop. 33,000.

Mercenaries (Lat. *mercennarii*, from *merces*, gain) are soldiers who offer their services for money to the army of any country which is willing to employ them. Greece found it necessary to use M. (*peltasts*) in the fifth century B.C., though for a long time the citizen hoplite remained the flower of the army. The famous Ten Thousand was composed of M., whom captains of reputation had collected at the bidding of the younger Cyrus. In Norman times M. were employed by the king, and the bulk of a medieval army often consisted of professional soldiers who were paid by a scutage tax levied on the peasantry. In addition to the mercenary cavalry, Brabant pike-men and It. crossbowmen were employed as M. The Swiss, by such victories as those of Granson, Morat, Nancy, etc., showed themselves the finest soldiers in Europe, and devoted themselves for a long time to professional soldiering, particularly in the employ of France. The *Landsknechts*, who fought generally in imperial armies, were a fine type of mercenary, and contributed more to the modern army in customs, etc., than even the Swiss. Throughout the eighteenth century Hessian regiments were employed for temporary purposes by the Brit. Gov. (e.g. the King's Ger. Legion was enrolled in 1794), and Gers., Swiss, and Its. were enrolled during the Crimean war. The employment of mercenary soldiers led to such things as the 'right of sack,' etc., and also to such developments as the *rondottieri* (g.v.), and the present state of public opinion concerning war would preclude any such system. See ARMY, FOREIGN LEGION, and the different countries named.

Meroe, John (1791-1866), Eng. industrialist and 'father' of textile chem. B. at Blackburn, Lancashire, he began work at the age of nine as a bobbin winder at the Oakenshaw print works. With the most meagre education M. invented a new method of textile printing and reorganised the Oakenshaw works. In 1844 he investigated the action of caustic soda on cotton, and his discoveries were

the foundation of Lowe's invention of mercerised cotton. This discovery that cellulose is soluble in a solution of copper oxide in ammonia later made possible the Bomberg process of manufacturing rayon. In 1850 M. was elected to a fellowship of the Royal Society.

Mercerised Cotton, fabric resembling silk in appearance, obtained from ordinary cotton by the action of strong caustic alkalis. The process of mercerisation was patented by John Mercer in 1850. Hanks of cotton yarn are stretched between revolving rollers and passed through vats of caustic soda maintained at constant temp. and density, and warm and cold water, and afterwards dried. The cellulose fibres of the cotton thereby become semi-translucent, tensile, and untwist to a cylindrical form. Cellulose hydrate probably results from the action of water on a cellulose-caustic soda compound first produced. *See ARTIFICIAL SILK.*

Mercerised Lisle, yarn processed exactly as lisle (q.v.) except that the cotton is chemically treated. While under tension in a solution of caustic soda, the fibres are stretched, and, swelling out, they regain their original tubular shape, this enabling the light to be reflected more readily, resulting in an appearance of lustre. This process is called mercerising after its inventor, John Mercer. M. L. is largely used for reinforcing the heels and toes of stockings so as to give extra strength at these points of wear. This yarn is also used in the manuf. of fine-gauge sheer stockings, called chiffon-lisles. *See A. W. Eley, Stockings*, 1946.

Mercers, dealers in small wares, retailing silks, velvets, and other rich fabrics. In the Middle Ages M. generally tended to leave the homelier cloths to the drapers. A London M. Gild existed in 1172. The M. Company is the premier livery company of London, being first chartered in 1393; the hall in Ironmonger Lane, off Cheapside, and the adjacent chapel are on the site of a hospital commemorating the bp. of Thomas à Becket. The company governs St. Paul's School, Hammersmith, and the M. School, Holborn. The corporate income of the company is £53,000; trust income, £58,000; membership, 200.

Merchandise Marks. By the Merchandise Marks Act, 1887, there is an implied warranty on sale of marked goods, that the mark is a genuine trade mark and not falsely applied, and, in the case of goods to which a trade description (see below) has been applied, that the description is not a false one within the meaning of the Act. But the seller is not liable to an action for damages if at the time of sale or contract he delivered a signed denial of any such warranty and the buyer accepted the document.

The offences relating to trade marks specified in the Act of 1887 bear a close resemblance to forgery. The Act makes it a criminal offence, *inter alia*: (1) To forge a trade mark, (2) falsely to apply to goods any mark so nearly resembling a trade mark as to be calculated to deceive, (3) to make a die for the purpose of forging a trade mark, and (4) to apply a false

trade description to goods. A trade description means any statement direct or indirect as to (i) the number, quantity, measure, or weight; (ii) the place of manufacture or production; (iii) the material of which goods are composed; or (iv) any patent, privilege, or copyright. The accused will escape conviction only if he can prove that he acted without intent to defraud. It is also an offence under the Act to have in one's possession for sale any manufactured goods to which any forged trade mark or false trade description is applied, unless the possessor can satisfy the court that he took all reasonable precautions, had no reason to suspect the genuineness of the mark or description, and that he afforded the prosecutor all the information in his power as to the source whence he obtained the goods in question. In all cases the offending goods must be forfeited. No prosecution under the Act is allowed after three years from the commission of the offence or after one year from its discovery. *See also under TRADE MARKS.*

Merchant Adventurers' Company was founded in 1296 by the duke of Brabant. In England it did not begin its activities until the reign of Edward III., and it was not incorporated till 1553. Sebastian Cabot (1476-1557) was governor, and it was under his auspices that Chancellor reached Moscow via the White Sea and thus opened up a trade route between this country and Russia. In 1564 a monopoly of trade with Germany and the Netherlands was acquired, and under James I. its yearly commerce with the Dutch and Ger. amounted to £1,000,000. The M. A. became known as the Hamburg Company when Hamburg became their chief port of traffic. The company was dissolved in 1808. *See W. E. Lengelbach, The Merchant Adventurers of England, their Laws and Ordinances*, 1902, and G. Unwin, *The Gilds and Companies of London*, 1908.

Merchant Navy, *see MERCANTILE MARINE.*

Merchant Shipping Acts. The law on merchant shipping is mainly to be found in the Merchant Shipping Acts, 1894-1937, the first of which is practically exhaustive of the subject (except in so far as more customary law is concerned). The term 'the M. S. A.' may be said to include also the Maritime Conventions Act, 1911, the Pilotage Act, 1913, the Merchant Shipping (Wireless Telegraphy) Act, 1919, the Fees (Increase) Act, 1923, and the Merchant Shipping (Safety and Load Line Conventions) Act, 1932. By the Merchant Shipping (Equivalent of Provisions) Act, 1925, power is given to exempt in certain circumstances foreign ships and Brit. ships registered outside the United Kingdom from certain provisions of the M. S. A. where there are equally effective provisions in the law of the foreign country or place of registration applying to these ships and provided the ships are proved to have complied with such corresponding provisions. None but Brit. subjects can own any share in a Brit. ship, and all but the smallest fishing or coastwise trading vessels must be

registered under the Act or they will not be recognised as Brit. There is no corresponding limitation on alien ownership in the case of any other class of property, for even land in the Brit. Isles may be owned to any extent by foreigners. The main provisions of the Merchant Shipping Act, 1894, as amended or supplemented by later Acts, are as follows:

Part I. Registry.—No ship will be a 'Brit. ship' unless owned by (a) natural-born Brit. subjects, (b) naturalised Brit. subjects, (c) corporate bodies subject to Brit. law and having their prin. place of business in the Brit. dominions. Persons who are (1) both natural-born Brit. subjects and citizens of a foreign state, or (2) naturalised Brit. subjects, will not be qualified to own a Brit. ship until they take the Oath of Allegiance to the king of Great Britain, and, further, unless during ownership they either reside in the dominions or are partners of a firm carrying on business in the dominions. All Brit. ships, except riv. or coastwise ships not exceeding 15 tons burden, and certain smaller Canadian fishing boats, must be registered at some port in the Brit. dominions. Before registry a ship's tonnage and build, together with such other particulars descriptive of her identity as may be required by the Board of Trade, must be certified by a surveyor; and her name (which can never be changed without the previous written consent of the Board of Trade), the name of her port of registry, her official number, and a scale of feet denoting her draught must be conspicuously marked on the parts indicated by the Act. The certificate of registry may be used only for the lawful navigation of the ship, and cannot be taken by any person in the exercise of any lien, mortgage, charge, or other right, or interest over the ship. The registration provisions of the prin. Act apply also to lighters and barges, subject to the Merchant Shipping Act, 1921; but under that Act vessels used exclusively in non-tidal waters (other than harbours) are exempt from the provisions of the prin. Act. The mode of transfer of a registered ship or share therein, when disposed of to a person qualified to own a Brit. ship, must be by 'bill of sale' in a prescribed form, containing such a description as will be sufficient to identify the ship to the satisfaction of the registrar. Transmission of ownership on death, marriage, or bankruptcy must always be authenticated in the manner provided, but transmission to an unqualified person necessitates a prompt sale by order of the court, the proceeds, after deduction of expenses, to be paid to the person entitled on transmission. A valid transfer may be made to a person not qualified to be a Brit. owner, but the ship at once loses her Brit. character and her certificate of registry must be given up, and if she be kept on the register subsequent to such transfer she will be subject to forfeiture. The following are registrars for the purpose of the Act of 1894: at any port in the United Kingdom or Isle of Man, the chief officer of customs; in Guernsey and Jersey, the chief officers

of customs and the governor; in Malta and Gibraltar, the governor; at Calcutta, Madras, and Bombay, the port officer; at any other port in any Brit. possession, the chief officer of customs, or, if none, the governor or his deputy *ad hoc*. A Brit. ship is bound to carry certain papers, and those generally carried are (1) The certificate of registry, (2) the agreement with the seaman (*see below*), (3) the charter parties and the bills of lading (if a merchantman), (4) the bill of health, (5) invoices containing particulars of cargo, (6) official log (*see below*). These papers must be shown to any naval commissioned officer, officer of the Board of Trade, chief officer of customs, mercantile marine office superintendent, Brit. consular officer, or registrar-general of seamen who may require to see them. It is a felony to forge, or in any way to assist in the forgery or fraudulent alteration of a register book, ship-builder's or surveyor's certificate, or certificate of registry, declaration, bill of sale, instrument of mortgage, or certificate of sale or mortgage, and a false declaration is a misdemeanour which renders the offender liable not only to imprisonment but to the forfeiture of his share in the ship. There are also other provisions in this part of the Act and that of 1906 to safeguard the national character of Brit. shipping and to protect the Brit. flag against imposition. The assumption of the Brit. flag on board a ship owned wholly or in part by dis-qualified persons (save to avoid capture by an enemy) involves forfeiture.

Part II. Masters and Seamen.—This part of the Act regulates the grant of certificates of competency to masters, engineers, and other officers of ships. The Merchant Shipping (Certificates) Act, 1914, contains provisions for the holding of examinations under the Board of Trade and deals fully with the engagement, discharge, wages, property, health, protection, and discipline of seamen. No one may engage or supply a seaman or apprentice without a licence to do so from the Board of Trade. The employment of children and young persons on board ship is regulated by the Employment of Women, Young Persons and Children Act, 1920. Provision is also made by the Merchant Shipping (International Labour Conventions) Act, 1925, for the medical examination of young persons employed on ships. Children under fourteen years of age may be employed only on ships on which members of the same family are also employed, but the prohibition does not apply to training ships or to school ships. As regards aliens, it is provided by the Aliens Restriction Act, 1919, that no alien may act as master, chief officer, or chief engineer of a Brit. ship, or as skipper or second hand of a fishing boat; but an exception is made in the case of those aliens who acted in such capacity during the First and Second World Wars, and who were certified by the Admiralty to have performed good and faithful service. The master of every ship (except in the case of ships of less than 80 tons burden) must enter into and sign an agreement with the

crew containing these particulars; (a) The nature and, as far as practicable, the duration of the intended voyage or engagement and the parts of the world, if any, to which the engagement or voyage is not to extend; (b) the number and description of the crew, specifying how many are engaged as sailors; (c) the time at which each seaman is to be on board or begin work; (d) the capacity in which each seaman is to serve; (e) the amount of wages; (f) scale of provisions; and (g) regulations as to conduct on board, including fines or other lawful punishment for misconduct. Running agreements, i.e. those extending over two or more voyages, may not go beyond the next following June 30 or Dec. 31, or the first arrival of the ship at her destination in the United Kingdom after that date, or the discharge of cargo upon that arrival. Agreements with lascars or any natives of India are also subject to special provisions mainly designed to ensure their return to India. Generally speaking, a seaman must have served four years before the mast to be entitled to the rating of A.B. Before paying off a seaman the master must deliver a true account of the wages due. A seaman has a right to wages up to the termination of his agreement whatever may happen to the ship, and an inalienable right of lien over the ship for their payment, but wages will not accrue during his refusal to work, imprisonment, or illness by his own default. Ordinarily the service of the seaman, under his agreement, terminated on account of wreck or loss of the ship, but, by the Merchant Shipping (International Conventions) Act, 1925, the right to wages continues during employment up to a maximum period of two months. There are also stringent provisions relative to the mode of dealing with the effects of seamen who may die on board ship. Severe fines may be inflicted on masters inexclusively leaving foreign seamen in distress in the United Kingdom. The Act of 1906 provides for the mode of dealing with wages and effects of seamen left behind out of the Brit. Isles, and for the repatriation of distressed seamen, and seamen left on land abroad without their consent or through discharge consequent on change of ownership of the ship at a foreign port. Shipowners are bound to supply medicines, medical stores, and anti-scorbutics (against scurvy) for use on board the ship. The Act of 1906 requires the master to furnish every member of the crew with provisions in accordance with the scale laid down in the first schedule to the Act. Masters are required to keep official log-books which may be kept distinct from or united with the ordinary ship's log; but in any case the official log must contain certain specified entries, mainly relating to illnesses, deaths, wages, and statements of the conduct of the members of the crew.

Part III. Passenger and Emigrant Ships.—The expression 'emigrant ship' includes only ships carrying (a) more than fifty steerage passengers, or (b) in the case of sailing vessels, more than one statute adult (person of twelve years or more) to

33 tons of the ship's tonnage, or (c) in the case of steamships, one statute adult to 20 tons. The Act of 1906 makes some important amendments to this part of the Act of 1894. A ship may not carry passengers, whether cabin or steerage, on more than one deck below the water-line, under a penalty not exceeding £500. The Act of 1894 prohibits shipowners and masters of passenger steamers, under pain of fine, from carrying passengers in excess of the number allowed by the passenger steamer's certificate. The maximum number of steerage passengers is regulated by Statutory Rules and Orders, 1917, which also regulate the berth accommodation for women passengers. There are also copious provisions relating to the general equipment of passenger steamers with compasses, hose, and safety appliances; the maintenance of order on passenger steamers; the survey of emigrant ships before proceeding outwards; the supply of provisions and water, and the carrying of an adequate medical staff on emigrant ships; the prohibition of the carriage of explosives or other dangerous goods; the delivery by the master to the customs officer at the port of clearance of a duly signed duplicate of the list of passengers, both cabin and steerage; and the forfeiture or release of a ship on payment of extremely heavy penalties for proceeding to sea without the master having obtained a certificate for clearance. Under the Merchant Shipping (Wireless Telegraphy Act), 1919, every seagoing British ship, being a 'passenger steamer' or a ship of 1600 gross tonnage or upwards, must be provided with a wireless telegraphic installation, and must maintain a wireless telegraph service which shall at least be sufficient to comply with the rules under the Act and also must be provided with one or more certified operators and watchers. Unless these telegraphic requirements are complied with, the Board of Trade will not grant a certificate of safety.

Part IV. is concerned with fishing boats and trawlers. Fishing boats must be registered, lettered, and numbered. Registered fishing boats, whether used for profit or not, must be provided with life-buoys or with a boat rendered buoyant. Contravention of this provision renders the owner liable to a fine of £100 and to the skipper £50. Penalties are provided for offences by seamen serving in fishing boats, such as desertion, continued breach of duty, smuggling, etc. The skipper must keep a record of occurrences such as death, injury, etc., of a member of his crew while at sea and every casualty to his boat. Boys (under sixteen) must be properly apprenticed or have agreements drawn up in prescribed manner, and an indenture of apprenticeship with a boy under thirteen is void.

Part V. Safety.—This part of the Act empowers the Board of Trade (strictly the Crown by order in council (q.v.) on the advice of the Board of Trade) to make regulations for the prevention of collisions at sea. These regulations contain stringent provisions as to lights, fog signals, and

steering and sailing rules. The Board of Trade is also empowered to make rules as to the life-saving appliances to be carried on board ship. There are also important provisions as to recording a ship's draught of water, and the marking of the load line (g.e.). The Merchant Shipping Act of 1906 applies the Brit. load-line provisions to foreign ships, *while they are within any port in the United Kingdom* (but without prejudice to the power of the Crown, under the Act of 1894, to apply those provisions to the ships of any foreign country, if the gov. of that country so desire). But the Act of 1906 allows the Board of Trade to make exceptions in the case of steamships that are not carrying cargo, and the board has excepted various classes of coasting steamers. The Act of 1906 lays down the conditions under which heavy timber goods may be carried as deck cargo. There are also analogous provisions as to loading 'light wood goods' on deck. Specified precautions must also be taken to prevent grain cargo from shifting. Sending 'unseaworthy' ships to sea renders the master and any person party thereto liable to a prosecution, the only defence to which is that such unseaworthy state was in the circumstances reasonable and justifiable. *Unsafe ships*, i.e. ships which by reason of the defective condition of the hull, equipments, or machinery, or by reason of overloading or improper loading are unfit to go to sea without serious danger to life, may be detained by Board of Trade officials for survey, and, if necessary, will not be released until made seaworthy. Costs incidental to survey and detention are recoverable from the owners as salvage. Shortly after the *Titanic* disaster an international conference was held in London to consider what steps could be taken by maritime states to make their laws governing safety of life at sea more effective. A convention was signed in 1914, but the occurrence of war postponed the operation of the Act passed in that year. In 1929 a second conference was held and a new convention signed abrogating the earlier one. The Merchant Shipping (Safety and Load-line Conventions) Act, 1932, gives effect to this convention, and also to yet another convention signed in 1930. This Act, which amends the Merchant Shipping Acts, 1894-1928, contains comprehensive provisions dealing with the construction of passenger vessels, life-saving appliances, radiotelegraphy, and safety of navigation. Provisions as to the submergence of load lines and life-saving appliances of fishing boats is made by the Merchant Shipping Act of 1937. Provision is made by the Act of 1932 for the issue by the Board of Trade of 'general safety certificates' in respect of passenger steamers which comply with all the construction regulations, rules for life-saving appliances, wireless telegraphy rules, etc. Under the regulations boats, lifeboats, life-rafts, and buoyant apparatus must be marked so as to show the dimensions, number of persons authorised to be carried, manning of boats and lifeboats,

and qualifications of lifeboat men, practising of boat drills, and methods and appliances for preventing, detecting, and extinguishing fires. There are special provisions in the Oil in Navigable Waters Act, 1922, dealing with the danger of fire arising out of the discharge of oil into navigable waters. The Act of 1932 provides that the master of a Brit. ship must render assistance on receiving a wireless distress call, unless he is unable or, in the special circumstances, he considers it unreasonable or unnecessary to do so.

Part VI. relates to inquiries and investigations as to shipping casualties, and the constitution of courts of survey and naval courts on the high seas and abroad.

Part VII. empowers a shipowner to land and warehouse cargo where the consignee fails to take delivery, and, by giving notice to the wharfingers, to retain control in the exercise of his lien for freight (*see LIEN*). If the lien is not discharged by production to the wharfinger of a receipt for the amount of the shipowner's freight and charges, and by payment on deposit by the owner of the goods of the amount claimed, the wharfinger may sell at the end of ninety days and apply the proceeds to the payment of customs and excise duties, expenses of sale, warehouse charges, freight and other shipowner's charges (in that order), the balance (if any) to be paid to the owner of the goods. By the Carriage of Goods by Sea Act, 1924 (which was passed as a result of the international conference on maritime law held at Brussels in 1922), the freedom of shipowners to contract out of disabilities was curtailed in the interests of consignees and endorsee(s) of bill(s) of lading who were not parties to the contract between ship-owner and carrier.

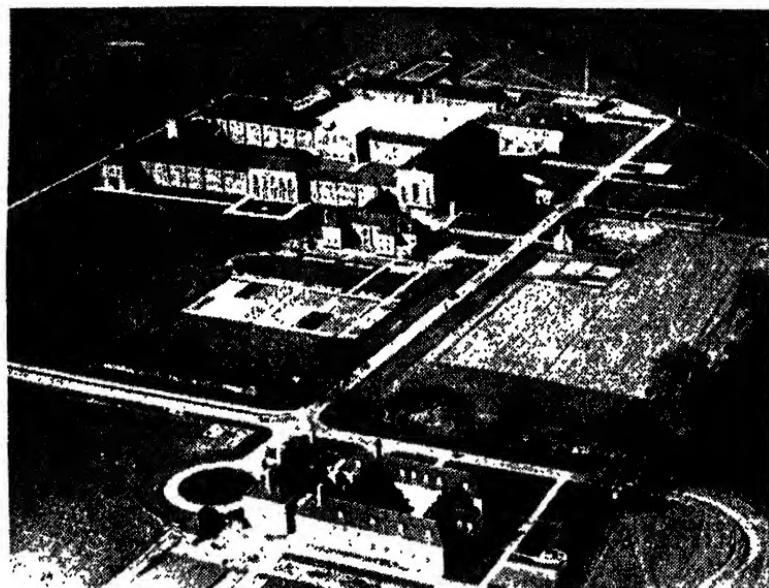
Part VIII., as amended by the Merchant Shipping (Liability of Shipowners and Others) Act, 1906, and the Merchant Shipping Act of 1906, limits the liability of a shipowner, Brit. or foreign, for loss of life or personal injury, or for loss or damage to goods, by reason of the improper navigation of his ship, or through any other cause not due to his actual fault or privity (whether in respect of persons and goods carried on his ship or on another ship with which his ship may have collided), to an aggregate amount not exceeding £15 per ton of the ship's tonnage for loss of life or personal injury, and £8 per ton for loss or damage to vessel's goods and merchandise. The shipowner is no longer exempted from liability for loss or damage or personal injury, by reason only of compulsory pilotage (*Pilotage Act*, 1913).

Part IX. deals with the powers and duties of receivers of wreck, the right of the Crown (q.r.) to unclaimed wreck, and the removal of wrecks by harbour authorities; regulates the trade of a marine store dealer; and regulates the procedure in salvage, providing for the mode of its apportionment among different claimants. Where salvage services are rendered by any ship belonging to H.M.'s Gov., and that ship is one which is specially equipped with salvage plant, or is a tug,

the Admiralty is entitled to claim for such services (Merchant Shipping (Salvage) Act, 1916).

Part X. deals with the powers of the Board of Trade as to pilotage dists. and authorities, but is replaced by the Pilotage Act, 1913, as being inconsistent, chaotic, and in conflict with the general law. The object of the above Act is that eventually the pilotage law for a dist. will be that Act, with the local order and by-laws made under it and confirmed by the Board of Trade. Pilotage is compulsory

service must be approved and licensed by the pilotage authority of the dist., and every pilot boat must bear certain distinguishing characteristics. Penalties are provided for pilots endangering ship, life, or limb, or for various offences in relation to their calling, such as lending their licences or selling intoxicating liquors. Under the Pilotage Authorities (Limitation of Liability) Act, 1936, the liability of a pilotage authority for loss or damage is limited to the amount of £100, multiplied by the number of pilots holding



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MERCHANT TAYLORS' SCHOOL, SANDY LODGE, NORTHWOOD

on (a) every ship navigating for the purpose of entering or leaving or making use of any port in a dist. in which pilotage is compulsory, and (b) every ship carrying passengers while navigating for the purpose in any pilotage dist., whether or not pilotage is compulsory. There are exemptions, e.g. in the case of tugs, dredgers, sludge vessels, barges, and similar craft. The owner or master of a vessel navigating under circumstances in which pilotage is compulsory will be answerable for any loss or damage caused by the vessel or by any fault of the navigation of the vessel in the same manner as he would if pilotage were not compulsory. Penalties are provided against masters knowingly employing unlicensed pilots without taking reasonable steps to obtain a licensed pilot or accepting the offer of a licensed pilot to pilot the ship. All vessels regularly employed in the pilotage

licences for the dist. of the pilotage authority.

Part XI. regulates the powers of lighthouse authorities throughout the Brit. dominions.

Part XII. specifies the sources and application of the Mercantile Marine Fund.

Part XIII. regulates legal proceedings under the Act.

Part XIV. relates to a variety of miscellaneous subjects, *inter alia* the appointment of surveyors by the Board of Trade; the powers of the board for enforcing compliance with the Act; and the appointment of inspectors to report on accidents.

The functions of the Board of Trade in regard to the Mercantile Marine were (1939) transferred to the Ministry of Shipping, later to the Ministry of War Transport, and finally to the Ministry of Transport.

See R. Temperly, The Merchant Shipping Acts (4th ed.), 1932.

Merchants' Statutes of, see ACTON BURNELL, STATUTE OF.

Merchant Taylors' School: 1. A public day school for boys, located since 1933 at Northwood, Middlesex, a splendid new school having been erected there. It was founded in 1561 by Sir Thomas White and by the company of M. T. of whom the governing body is still composed. The old school buildings were destroyed by the Great Fire (1666) and were reconstructed in 1667; the next house was erected in 1873-74 on the site of Charterhouse School, which latter was transferred to Godalming, the M. T. S. coming from Suffolk Lane. The school has three sides, classical, modern, and special, the last providing tuition in higher mathematics and science, and in biology for the univs. The school is recognised as a 'school of science' by the Conjoint Board of the Royal Colleges of Physicians and Surgeons. The classical side also gives tuition in Heb. up to scholarship standard. Presentations to the school are in the hands of the governors, the members of the court of the M. T. Company; without such nomination a very limited number of boys may be admitted on the recommendation of the headmaster. There are numerous entrance and valuable leaving scholarships and exhibitions. M. T. S. differs from St. Paul's, Rugby, and other great public schools in its constitution; not being divided into scholars and commons; and there is no endowment. There is limited accommodation for boarders. Edmund Spenser was a scholar at M. T. S., as were also Robert Clive, Lancelot Andrews, bishop of Winchester, and Juxon, bishop of London. A register of the school, covering the years 1561 to 1934, and ed. with biographical notes by E. P. Hart, was pub. in 1936. 2. At Great Crosby, Liverpool, was from 1618 until 1910 controlled by the M. T. Company. There is now joint control by the univs., the old boys' association, and local bor. councils. There are about 500 pupils, mostly day boys.

Merchweiler, tn. in the Rhineland, Germany, 33 m. S.S.E. of Trèves. Pop. 5000.

Mercia, central kingdom of England in the days of the A.-S. The name refers to the march or borderland beyond which dwelt the hostile Welshmen. In the seventh century it extended from the Humber to the Thames, with the exception of E. Anglia. There were independent sovereigns of M. at least from 615 to 874, when the Danes overran the E. portion. The greatest kings were Penda (626-55) and Offa (755-94). See F. M. Stenton, *Anglo-Saxon England*, 1943.

Mercié, Marius Jean Antonin (1845-1916), Fr. sculptor and painter, b. at Toulouse. He became famous when he exhibited his patriotic work in bronze entitled 'Gloria Victis.' He also executed in marble a beautiful statue for the tomb of Mme Charles Ferry, 'William Tell' in Lausanne. 'Thiers' in St. Germain-en-

Laye, and a group called 'Justice' in the *hôtel de Ville*, Paris.

Mercier, Désiré Joseph (1851-1926), Belgian cardinal, b. at Braine-l'Alleud, Brabant, son of Paul Léon M., amateur artist, of an old bourgeois family. Educated at Malines, college of St. Romuald, Petit Séminaire, and Grand Séminaire, he was ordained priest in 1874, when at Louvain Univ. In 1877 he was recalled to teach at Malines, and in 1882 attached to the faculty of theology at Louvain. After visiting Leo XIII. at Rome, he was placed at the head of an institute of Thomistic philosophy, endowed by that pope. He wrote some text-books in this connection, and became a leader of the modern revival of Thomistic philosophy in Europe. In Feb. 1906 he succeeded Cardinal Goossens as archbishop of Malines and primate of Belgium. Made cardinal 1907, he was received by George V. in London, Sept. 1914, and then returned to his invaded country, where during the years of occupation he watched over his flock, enjoining loyalty to the Belgian Gov. only, and provoking the wrath of the Ger. authorities, who ineffectually tried to prevent his visiting Rome, Jan. 1916. In the autumn of 1919 he made a tour of the U.S.A. and Canada. He attended the conclaves for the papal election in 1914 and 1922. He pub. an *Appeal to all Christian People* which led to the 'Malines conversations' with representatives of the Anglican Church, 1923-24. See lives by A. Laveille, 1926; C. Verwoort, 1928; and J. A. Gude, 1934.

'Mercure de France': 1. Estab. in 1672 as the *Mercur Galant*, in 1714 it was renamed the *M. de F.* It was a most enterprising paper, and besides containing state and court news, statistics, satires, reviews, and fashions, it opened its columns to some of the best contemporary Fr. poets of the Symbolist school. It ceased pub. in 1799, was revived a few years later, but finally disappeared in 1825. 2. Fr. literary jour. founded in 1890 under the direction of Alfred Valette. Under the influence of R. de Gourmont it became the rallying point of the Symbolists and the centre of the new verse. It existed until June 1940, and appeared again in June 1946. 3. Fr. publishing house of Paris, noted for its eds. of Nietzsche (trans. by H. Albert) and the works of André Gide, Paul Claudel, Georges Duhamel, and G. Apollinaire.

Mercuric Chloride, see CORROSIVE SUB-LIMATE.

Mercurius, or **Mercury**, was the Rom. god of commerce, his name being derived from *merx*, merchandise. A temple near the Circus Maximus was dedicated to him, and his festival was celebrated on May 25 by the mercuriales, who were members of a college regulating the corn trade. Mercury was identified with the Gk. Hermes as early as 495 B.C. But the fetiales (q.v.) did not recognise the identity, and in place of the caduceus or wand carried by Hermes, as the messenger-god, they used a sacred branch as the emblem of peace. A 21-in. bronze figure of M. of the second

century has been recovered from the great temple, at a depth of 300 ft., at Colchester.

Mercury, planet nearest the sun, is the smallest of the major planets, having a diameter of about 3000 m., i.e. three-eighths that of the earth. It is three times the bulk of the moon; its mean distance from the sun is 36,000,000 m. (or 0·4 of the earth's mean distance); and it takes 87·969 days to revolve round the sun. Owing to lack of distinct surface marking it has never been definitely settled how long M. takes to rotate on its axis. For long it was thought that it did this in about 24 hrs., but the opinion of Schiaparelli, backed by Lowell, is that M. rotates so slowly that the same face is always presented to the sun. The orbit of M. is of considerable eccentricity, so much so that it receives less than half the amount of heat from the sun during its aphelion passage than it does at perihelion, the mean of heat and light being seven times more than that received by the earth per unit area. The orbit is also inclined to the plane of the ecliptic 7°, and its maximum angular distance from the sun is 28°. This means that the planet is visible at the most for only about 2 hrs. before or after sunset. The apparent diameter of M. is from 4·5° to 13° and at times it shines with a greater brilliancy than the star Arcturus, but because of its closeness to the sun it is rarely seen.

M. has been known from the most ancient times, but it was naturally not till the invention of the telescope that its transit across the sun's face was observed first by Gassendi, on Nov. 7, 1631. These transits occur on an average once in six years.

Mercury, or Quicksilver. Symbol Hg; atomic number 80; atomic weight 200·61. A metal, a liquid at ordinary temps. It occurs to a small extent in an uncombined state as small globules, but its chief ore is *cinnabar*, HgS , mercuric sulphide. The metal is obtained from the ore by roasting it, when the sulphur is oxidised to sulphur dioxide, and the M. is set free from combination. During this reaction the M. becomes vapourised. The vapour is passed through a series of cooling chambers where it is condensed. The mines occur in a very few places; chief amongst them may be mentioned Almaden, Istria, and California. The metal possesses some remarkable properties, in that at ordinary temps. it is a bright silvery liquid. At -38·9° C. it assumes a solid form, which is crystalline, ductile, malleable, and very soft. It boils at 357° C., giving off a colourless vapour. Owing to this large range of temp. between the limits of which it assumes the liquid state, M. is commonly used in thermometers, but its usefulness is restricted in the lower direction, since it freezes so easily. At 0° C. its density is 13·595 gm. per c.c., and its coefficient of expansion is 0·000182 between 0° C. and 100° C. It is a good conductor of heat and electricity. It dissolves certain metals to form amalgams. These amalgams are used for several practical purposes: zinc amalgam is used to cover the zinc plates of batteries

owing to the fact that it is very slowly acted upon by dilute sulphuric acid; tin amalgam is used for the construction of mirrors; and gold and other amalgams are used by dentists for filling teeth. These amalgams can also be made by the electrolysis of salt solutions, using a M. cathode, and by attacking a solution of a salt with sodium amalgam. The so-called ammonium amalgam (q.v.) is of special interest. M. is employed very largely in scientific work for the construction of thermometers, barometers, vacuum pumps, and on the large scale for the extraction of gold and silver (q.v.). For scientific work it must be clean and must not foul the surface of the containing vessel. Dirty M. can be cleaned by filtering through muslin (or filter paper with a small hole punctured at the apex) to remove suspended dirt and then allowed to fall slowly down a burette filled with dilute nitric acid to remove other impurities. M. forms two independent series of salts—the mercurous and mercuric. Mercuric oxide, a reddish crystalline powder, is obtained by heating M. in contact with the air. This oxide is decomposed at a higher temp. into its constituent elements. In this connection the work of Priestley and Lavoisier should be recalled (see AIR; OXYGEN).

The mercuric salts are obtained from this oxide by dissolving it in the various acids. Mercuric chloride (corrosive sublimate) is prepared by heating together a mixture of mercuric sulphate and common salt. It is a violent poison the best antidote being the white of an egg. It is largely used as an antiseptic. Mercuric sulphide is obtained by rubbing vigorously together M. and sulphur. When sublimed it assumes a red crystalline form known commercially as the pigment *vermilion*. Calomel, or mercurous chloride, is the most important of the mercurous salts. It is generally prepared by heating a mixture of mercuric chloride and M. The mercurous chloride sublimes as a white fibrous cake. It is insoluble in water, and is tasteless. M. is used largely in medicine, in the form of chlorides or iodides. M. compounds, especially if they are soluble, are very poisonous, and even as medicinal preparations should not be insisted on for long periods.

Mercuric fulminate is made by adding a solution of mercuric oxide in nitric acid to 90 per cent alcohol, warmed to about 54° C. After a brisk action white crystals of the fulminate appear, and after washing free from any acid they are spread out and vacuum dried at a moderate temp. (This should not exceed about 35° C., since at higher temps. there is the possibility of deterioration.) Mercuric fulminate is used as a detonator (see EXPLOSIVES) since it is very susceptible to shock, under the influence of which it decomposes with explosive violence.

Mercury's Wand, see DIVINING ROD.

Meroy, Sisters of, see SISTERHOODS.

Mer de Glace, comparatively low-lying and accessible glacier near Chamonix, running northwards from Mont Blanc (q.v.) between the magnificent precipices

of the Chamonix Aiguilles on one side and the Drus and the Verte on the other. It is the subject of a painting by Turner.

Mere, Maori weapon made of stone, flat and spatulate, and with a short handle.

Mére, Paul Louis Courier de, see COURIER.

Meredith, George (1828-1909), Eng. novelist and poet, b. Feb. 12 at 73 High Street, Portsmouth, was descended from a family that had been for sev. generations tailors at Portsmouth. His grandfather, Melchizedek M., would appear to be the original of Mel in *Eran Harrington*. M. was educated in his native tn., and afterwards, from the age of fourteen, at the Moravian School at Neuwied, near Koblenz, being greatly influenced in religious matters by his teachers. In 1844 he came to London, and was articled to a solicitor, but he soon drifted into authorship, and wrote poems which appeared in *Household Words* and *Chambers's Journal*. He married Mrs. Nicolls, the widowed daughter of Thomas Love Peacock, in 1849; she was nine years older than he, and they separated some years later. In 1861 Mrs. M. d., and in 1864 M. married Marie Vulliamy, with whom he lived happily for twenty years. His *Faith on Trial* reflects his grief at her death in 1885. From 1868 he lived at Flint Cottage, Box Hill, where he d. In 1905 he received the Order of Merit. Like Thomas Hardy, M. began as poet, and continued as poet in the intervals of writing novels. He pub. his first vol. of Poems in 1851, with a dedication to Thomas Love Peacock. As a poet M. began with easily intelligible lyrics, such as *Love in a Valley*. This reflects the lyrical mood of the early scenes of the novel *The Ordeal of Richard Feverel*; the complex analysis of mood, so marked in the other novels, also has a poetic counterpart in *Modern Lore* (1862). His

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Ordeal of Richard Feverel (1859), a delicate romance, yet without sentimentalism, was acclaimed by sev. critics, but it was not a financial success, and M. perforce had to turn to journalism for a living. He also worked as reviewer, publisher's reader, and, at John Morley's invitation, editor of the *Fortnightly* for a time. *Eran Harrington* (1861) was more remunerative, and it is certainly one of the most amusing of his novels. *Sandra Belloni* (1864) and the sequel *Vittoria* (1866) did nothing to secure him public recognition; but *Rhoda Fleming* (1866) was more widely read, though it is a painful, if a beautiful, story. *The Adventures of Harry Richmond* (1871), which had been serialised in the *Cornhill Magazine*, improved his position, and this, with *The Egoist* (1879) and *Diana of the Crossways* (1885), are among his best books. Other novels are *Brauchamp's Career* (1876); *The Tragic Comedians* (1880); *One of our Conquerors* (1891); *Lord Ormoni and his Aminda* (1894); and *The Amazing Marriage* (1895). Also in 1895 he republished his short stories in a vol. entitled *The Tale of Chloe*. The

Essay on Comedy (1897) is his one contribution to the literature of criticism. His definition of comedy, 'the singular scene of charity issuing of disdain under the stroke of honourable laughter,' is not so much the comedy of dramatic art as that to be found in the tales of Chaucer. M. insisted that in drama a truly comic figure should be presented without contempt, like his own pompous Sir Willoughby Patterne in *The Egoist*, and in this sense Barrie's *Twelve Pound Look* is M.'s ideal comedy, yet it does not possess the rapier thrusts of wit M. demanded.



GEORGE MEREDITH

M. wrote many poems, and collected them at various times under the titles of *Modern Lore and Poems of the English Roadsides* (1862); *Poems and Lyrics of the Joy of Earth* (1883); *Ballads and Poems of Tragic Life* (1887); *A Reading of Earth* (1888), etc. M.'s philosophy of life, implicit in the novels, takes on a fuller expression in his later poetry than in any of his prose works. These metaphysical poems, such as *Poems and Lyrics of the Joy of Earth*, seek in their hard tortuous language to reconcile morality with the lessons of biology. Bestiality and sentimentalism are for ever cramping man in his uphill striving after the normal life or life of 'common sense.' Both the poems and the novels express M.'s belief that comedy could reveal man's frailties, but the poems, though difficult to read, express this faith more openly. Even in the middle years of Victorianism, M. revealed an anti-Victorian tendency; for in 1869 we find him saying in one of his letters: 'Isn't there a scent of damned hypocrisy in all this lisping and vowelled purity of the Idylls?' (of Tennyson). Like Browning M. was an optimist, but, unlike Browning or Tennyson, he was an agnostic and did not accept without reservation the immortality of the soul. Yet despite his agnosticism and his conception of Nature as utterly pitiless to the individual,

he was a convinced optimist, and while rejecting unreasoned or delusive hopes for the future of the individual ego he saw the individual life as living on in the larger life of the future of the race. M. regarded life as a tragic-comedy, and his humour is reflective, even mournful in character, but he is too profound a humorist ever to indulge in cynicism, though there is much irony in his writing.

No other Eng. writer perhaps is his equal in the skilful manipulation of language and the power to give such subtle pleasure to the reader. Though generally recognised by competent critics as one of the greatest, if not the greatest, novelists of his day, M. was never widely read. It may almost be said that he had to wait for nearly thirty years before securing true recognition, and then soon lost it again; yet he was quickly acclaimed by those who were judges of literature, Swinburne, George Eliot, and Charles Kingsley. He was the novelist of the man of letters rather than of the general public. He has been well, if unkindly, summed up by Oscar Wilde: 'His style is chaos illumined by flashes of lightning. As a writer he has mastered everything but language.' The obscurity of his style used at one time to be hailed by the 'intellectuals' as his great merit, but it is now generally accepted that he is great, not because of, but in spite of, his style. Metaphor, symbolism, and a fondness for ellipsis partly explain the obscurity of his style, as well too as profundity of thought and punctilious avoidance of the commonplace, and an almost wilful abstention from all explanation or interpretation. Of his genius there can never be any question. He saw life clearly, he had wit in abundance, and a power of understanding and describing women that is at once the joy and despair of his brother novelists. His poetry was full of true appreciation of nature, and he could write poetry not only in verse but also in prose as in 'Diversion on a Penny Whistle' in *Richard Feverel*. Like all great writers, he had full confidence in his powers and attained easily to heights that few of his contemporaries would have dared to attempt. As Stevenson happily put it: to provide the author of *The Egoist*, God had first to create a gentleman and then give him genius.

M.'s *Letters*, ed. by his son, were pub. in 1912, and the *Poems*, ed. by G. M. Trevelyan in the same year. See lives by Seccombe; Ellis; Lady Butcher, 1919; J. B. Priestley, 1926; A. H. Able, 1933; M. E. Mackay, 1937; and S. Sassoon, 1948. See also B. Albers-Arndt, *Die englische Gesellschaft im Spiegel der Romane von George Meredith*, 1931, and C. B. Petter, *Meredith and his German Critics*, 1939.

Meredith, Owen, see LYTTON, EDWARD ROBERT BULWER.

Meresleke, tn. in the prov. of E. Flanders, Belgium, 5 m. S. of Ghent, engaged in agriculture, floriculture, and manufs. of earthenware and bricks. Pop. 9600.

Merendera, genus of hardy bulbs allied to the genus *Colchicum* (q.v.).

Merewether, vil. forming a suburb of

Newcastle in Northumberland co., New S. Wales. Pop. 4500.

Merezhkovski, Dmitri Sergeyevich (1865-1941), Russian author, b. in St. Petersburg, where he was educated. His first pub. was a vol. of verse, 1888; *The Causes of Decadence in Modern Russian Literature* (1893) was an essay of considerable fame. Then he produced a trilogy of historical novels entitled *Christ and Anti-christ* (1901-5), about Julian the Apostate, Leonardo da Vinci, and Peter the Great. Other pubs.: *The Death of the Gods* (1901); *December the Fourteenth* (1920); *The Birth of the Gods* (1926); *Akhnaton, King of Egypt* (1927); *The Life of Napoleon* (1929); *Napoleon, a Study* (1929); *Michael Angelo and other Sketches* (1930); and *The Romance of Leonardo da Vinci* (1931). Also *Paul I.* (1908) and *Tsarevich Alexis* (1921) (plays).

Merganser (*Mergus*), genus of sea ducks characterised by a very long slender beak. *M. merganser*, sometimes called the goosander or jacksaw, is a handsome Brit. bird. The male's plumage is variegated with black, greenish-black, pink and white. The red-breasted M. (*M. serrator*) breeds in the N. of Britain; the drake has a crested glossy green head, white neck, red breast, and black upper surface with white margins. *M. australis* is a rare species found only in the Auckland Is.

Mergui, dist. and seaport of Lower Burma. Forests of teak, etc., cover almost all the 9789 sq. m. of the dist. which lies in the Tenasserim div. The tn. is a pearlning station, and exports rice, timber, rattans, dried fish, etc. Pop. of dist. about 181,000.

Mergui Archipelago, group of hilly is. off the Tenasserim coast in the bay of Bengal. The native Selungs barter caoutchouc, edible birds' nests, and bêche-de-mer for rice and spirits.

Merian, Matthew (1621-87), portrait painter and engraver; did not renounce his own profession when in 1650 he inherited his father's book and print business. He painted an equestrian picture of the Emperor Leopold I.

Mérida: 1. (Anct. *Augusta Emerita*, the cap. of Lusitanus), tn. 32 m. E. of Badajoz, on the Guadiana, in Badajoz, Spain, with numerous Roman remains. Pop. 14,600. 2. Univ. city, 336 m. S.W. by W. of Caracas, and the cap. of a state of the same name, in Venezuela. The religious and academic centre of Venezuela, it has an archbishop. The univ. of Los Andes has 470 students. M. grows cacao, wheat, and coffee, and manufs. cottons and woollens. Pop. of state, 193,000; of tn. 10,500. 3. Cap. of Yucatan, Mexico, 23 m. S. of its port, Progresso, on the gulf of Mexico. The fourth city in size of Mexico, it is situated in flat agric. country, almost entirely devoted to henequen (sisal fibre). Founded by the Spaniards in 1542, it has a beautiful cathedral, large hospital, massive buildings, and well-paved streets. Besides the sisal industry, there are manufs. of soap, chocolate, and hemp. Its chief exports are sisal, chicle, hides, and agric. produce. Pop. 99,000.

Meriden, tn., manufacturing plated ware and cutlery, etc., 18 m. N.N.E. of New Haven, Connecticut, U.S.A. Near by is Hubbard Park, a reservation of 900 ac. Pop. 39,400.

Meridian (from Lat. *meridies*, noon), both a terrestrial and a celestial great circle. The terrestrial M. of any given place is the line running through that place and through both the N. and S. poles. Each terrestrial has a corresponding celestial M., which passes through the N. and S. celestial poles, and also through the zenith and nadir of any place on that terrestrial M. When the sun passes the M. of Greenwich, it is not only apparent noon at Greenwich, but also at all places situated on the same half of that M.

Meridian, co. seat of Landerdale co., Mississippi, U.S.A., 89 m. from Jackson. It is an important cotton trade and industrial centre, with lumber mills. Pop. 35,400.

Meridian, Magnetic, see under DIP.

Mérignac, com. of Gironde in the arron. of Bordeaux, France. Pop. 21,400.

Mérimée, Prosper (1803-70), Fr. man of letters, b. in Paris, was the son of an artist. When his education was completed he entered the civil service, where his work was so well esteemed that by his thirtieth year he had been appointed inspector-general of historical monuments. He was a great favourite of the Emperor Napoleon III, and of the Empress Eugénie, and in 1853 he was made a senator under the empire. He began his literary career with some dramatic pieces professing to be from the Sp. of an imaginary Clara Gazul (*Théâtre de Clara Gazul*, 1825), and followed this with a collection of pretended Illyrian folk-songs, signed with an anagram of the previous name, 'La Guzla.' Up to that time his work was romantic in subject and form, but he subsequently turned to the writing of the stories on which his enduring fame depends. Though still romantic in their predilection for strange and less civilised countries and the interest revealed in foreign literature (he travelled much in Spain and was fond of writing on Sp. themes), they are essentially realistic in their local background and atmosphere and in the truth of their historic archaeological and artistic descriptions. In his chief works he stands midway between Stendhal, whose influence he acknowledges, and Balzac, though as an artist he is superior to both.

His character is a fascination to the student of biography. A casual acquaintance would have found it hard to believe that his outward cynicism was only a mask for that warmth of feeling and capacity for deep and devoted attachment which prompted him to write his intimate and charming *Lettres à une inconnue* (pub. posthumously, 1873). Many, moreover, have blance to the Florentine scholars of the Renaissance: his love of dwelling on the tragic, grim, and eerie elements in life is emphasised in his powerful short stories, *La Vénus d'Ille* and *Lokis*, and in his vivid romance, *La Jacquerie*; and his fund of Rabelaisian humour is conspicuous in

his letters to Panizzi. He recalled the Florentines in the diversity of his interests, a diversity which enabled him to write so valuable an archaeological essay as *Description des peintures de Saint-Savin*, such as the *Chronique de Charles IX.* (1829) and the *Histoire de Don Pédre I.* (1848), a literary supercherie like *La Guzla* (1827), and *nouvelles* like the Corsican tale *Colomba* (1840). His chief writings, besides those already mentioned, are *Maleo Falcone* (1829); *L'Enlèvement de la redoute* (1829); and *Carmen* (1846), which inspired the libretto of Bizet's opera. Other works: *La Famille de Carral* (1828); *La Vision de Charles XI*



PROSPER MÉRIMÉE

(1830); *La Double Méprise* (anon. 1833); *Les Ames du purgatoire* (1834); *Notes d'un voyage dans le midi de France* (1835); *Notes d'un voyage dans l'ouest de France* (1836); *Notes d'un voyage en Auvergne* (1838); *Notes d'un voyage en Corse* (1840); *Etudes sur l'histoire romaine* (1844); *Mélanges historiques et littéraires* (1855); *Henri Beyle* (Stendhal) (1864); and *Les Cosacos d'uturefons* (1865). See G. H. Johnstone, *Prosper Mérimée, a Mask and a Face*, 1927; also lives by A. Filon, 1894, and P. Tralhard, 1925, 1929, and 1930.

Merionethshire, maritime co. of N. Wales, bounded on the W. by Cardigan Bay. The co. is mountainous, the chief peaks being Arran Mawddwy (2972 ft.) and Cader Idris (2949 ft.). The most beautiful valleys are those of the Dwyryd (Dyff) and the Mawddoch. The R. Dee (Dyfrdwy) drains Bala Lake (5 m.), the largest in Wales, and flows towards Corwen, receiving sev. trib. on the way, and there are over fifty lakes among the mts. and sev. waterfalls. Slate is quarried at Ffestiniog, and near Dolgelly, the co. tn.; gold is found, while lead, copper, and manganese have been worked. Agriculture does not flourish, except here and there in the valleys; the small hardy Welsh ponies are bred. Woollen stockings

and flannels are manufactured. Barmouth, Dolgelly, and Harlech are much visited by tourists. The area is 819 sq. m. Pop. 45,100.

Meristem, generating tissue, that part of a plant where growth is active. It consists of cells of nearly uniform size capable of dividing to form new cells. These enlarge and after certain modifications form the permanent tissue.

Merit, Order of, Brit. order instituted in 1902, limited in number to twenty-four men and women of eminent distinction. It confers no precedence or knighthood. Membership is either military or civil, the badge of the former having crossed swords, and the latter oak-leaves. Membership is designated by the suffix O.M., which follows the first class of the Order of the Bath and precedes the letters designating membership of the inferior classes of the Bath and all classes of the remaining Orders of Knighthood. An Indian O. of M. was instituted in 1837 for native officers and men, and there are similarly named orders in sev. foreign countries. See under ORDERS OF KNIGHTHOOD.

Meritorious Service Medal, instituted in 1845 for the Brit. Army and extended to the Royal Marines in 1849. In the army it was originally granted to specially selected sergeants, but during the First World War all warrant officers, N.C.O.s, and men were eligible as a reward for gallant conduct in the performance of military duty. It is now restricted to warrant officers and N.C.O.s above the rank of corporal. In the Royal Marines similar restrictions are applied. The grant carries with it an annuity not exceeding £20. The ribbon is crimson with white edges. The effigy of the reigning sovereign is on the obverse of the medal and 'For Meritorious Service' is engraved on the reverse.

Merivale, Charles (1808-93), Eng. historian, son of John Herman M. (d. 1844), b. in London, and educated at Harrow, Hallebury, and Cambridge. He rowed in the first inter-univ. boat-race (1829), and became rector of Lawford, Essex (1848-69); Hulsean lecturer (1861); Boyle lecturer (1864-65); chaplain to the Speaker (1863-69); and dean of Ely from 1869. Among his works are *A History of the Romans under the Empire* (1850-62); *Conversion of the Roman Empire* (1864); *Homer's Iliad in English Rhymed Verse* (1869); *The Roman Triumvirates* (1876); *The Heathen World and St. Paul* (1877); and his *Four Lectures on Some Epochs of Early Church History* (1879). See J. A. Merivale (editor), *Autobiography and Letters*, 1898.

Merka, or **Markah**, seaport of the former It. Somaliland. E. Africa, 45 m. S.W. of Magadovo. Pop. (Arab and Somali) 4200.

Merksem, tn. of Belgium and suburb of Antwerp, 3 m. to the N., on the Albert Canal. It is engaged in manufs. of margarine, oil, chemicals, bottles, lead, zinc, textiles, chicory, sugar, and leather. Pop. 29,100.

Merle d'Aubigné, see AUBIGNÉ, JEAN HENRI MERLE D'.

Merlin, wizard who worked many wonders at King Arthur's court. He sprang from the intercourse of a Welsh maiden with a demon, but was saved from evil by baptism, although, throughout life, he retained his father's gift, the power of magic and divination. It was he who had the care of the infant Arthur and later disclosed to him his royal parentage. Tennyson tells of the wisdom of M. in his *Idylls of the King*, but Geoffrey of Mounmouth in his *Vita Merlini* was the first to throw light on his shadowy existence.

Merlin, or *Falco tenuirostris*, small Brit. falcon found breeding in the N. of England and Scotland. It is essentially a falcon of the rocks and moors. On the moors the nest is generally built on a slope among the heather, and in other localities on the ledge of a rock, and in it three to five bluish-white eggs, blotched with brown markings, are laid. Adult males are blue-grey on the head, back, and wing coverts; the under parts are rufous; the tail is bluish-grey with dark bands and white tips; the legs are yellow and feathered a third of the way down. The young when first hatched are covered with a soft white down. When fully fledged they resemble the female, which is more uniform brown. It is an easy bird to tame and is readily trained to fly at larks in the autumn, while a female M. will take plover and pigeons.

Merlino Caccajo, see FOLENGO, TEOFILIO.

Mermaids and Mermen (*mere*, lake; *mægd*, maid), in folklore a class of semi-human beings, whose true home is in riv. or sea. They were supposed to be capable of living on land and of entering into social relationships with ordinary mortals, and the typical mermaid is represented as a woman of exceeding beauty down to the waist, the figure ending in a fish's tail and body with scales and fins. Mermaid legends exist in nearly all countries and have given rise to beautiful tales and poems, such as J. d'Arras's *Chronique de la Princesse Mélusine*, and Matthew Arnold's *Forsaken Merman*. The connection of these beings with mortals generally brought disaster in its train. The Phoenician Dugon and the Chaldeo-Babylonian Oannes or Hea (fish-gods) were usually represented as half fish, half human. See J. L. Grimm, *Deutsche Mythologie*, 1835; R. Hunt, *Popular Romances of the West of England*, 1865; S. Baring-Gould, *Curious Myths of the Middle Ages*, 1866-68; T. Keightley, *The Fairy Mythology*, 1878; P. Sébillot, 'Contes des Marins' in his work *Contes populaires de la Haute-Bretagne*, 1880-82; M. Yearsley, *The Folklore of Fairy Tales*, 1924; Evelyn Smith, *Myths and Legends of Many Lands*, 1930; and Jean Lang, *Book of Myths*, 1934.

Mermaid's Purse, purse-shaped egg case of the skates and dog-fish.

Mermaid Tavern. This tavern, mentioned in *Expenses of Sir J. Howard* (1641), stood in Cheapside, with side entrances in Friday Street and Bread Street, and was destroyed by the Great Fire of London. Raleigh is the reputed founder of the famous Mermaid Club (c. 1603). See Gifford's ed. of Ben Jonson).

Probably Jonson, Beaumont, Fletcher, Donne, Shakespeare, Carew, Cotton, and Selden were members of this club, which was noted for its Canary wine and the sparkling wit of its frequenters. It is sometimes called the Friday Street or Bread Street Club.

Merodach-Baladan, or Marduk, II. (c. 722-709 B.C.), king of Babylon. Under this powerful prince the Babylonians, aided by the Elamite court, reasserted their independence. There was a long struggle with Sargon, king of Assyria, who finally captured and destroyed Babylon (710). On Sargon's assassination, his successor Sennacherib drove M. from the Babylonian throne (705). See 2 Kings, xx. 6.

Meroë, Isle of, wide tract of S. (upper) Nubia, anct. Ethiopia, almost surrounded by the Nile's branches, the Astabas (Bahr-el-Azrek, Blue Nile) and the Astaboras (Atbara). The ruins of anct. M., later cap. of Ethiopia, and rival cap. of the earlier Napata, are supposed to be on the Nile's E. bank, near Shendi, 3 m. from Kabushia. The modern Merowé is not to be confused with M. The Meroitic period in the Sudan is that during which M. was the cap., and it was contemporary with the Ptolemaic age in Egypt. The Meroitic remains are more widely distributed than those of any other period. At the acme of the Meroitic dynasty its rule extended from Semnar to Shellal. The prin. site is that of M. itself and the city and pyramids of Begrawiya, 3 m. N. of Kabushia. The city was partly excavated by Prof. Garstang, who uncovered the great temple of Amon. E. of the city are the remains of the 'templo de the Sun,' founded about 600 B.C. Most of the remains, however, belong to the second or third century A.D. Reisner excavated the pyramids in 1920-23. There are ruins of temples at Nagara and at Musawwarat, and other distinctive remains of the period are reservoirs (*hafirs*), rock pictures and carvings, and decorated pottery. The Meroitic kingdom was probably split up into petty kingdoms before A.D. 350, when the dynasty was finally ended by the invasion of the king of Axum who devastated Ethiopia. The region now forms part of the Sudan. See also MEROWE. See J. Garstang and F. L. Griffith, *Meroë: First Season's Excavations, 1909-10, 1911*, and J. A. de C. Hamilton (editor), *The Anglo-Egyptian Sudan from Within*, 1935.

Merom, Waters of (Huleh, Baheiret el-), lake of Palestine, mentioned in the O.T., most northerly of the series traversed by the Jordan. It is the Lake Seinechonitis of Josephus, nearly triangular in shape, 4½ m. long by 3½ m. broad. See Josephus, *Antiquities*, V. v. 1.

Meropidae, see BEE-EATER.

Merovingians, or Merwings, name of the first dynasty of Frankish kings in Gaul, who ruled after the fall of the Rom. Empire. The name is taken from Merwig or Merovech, king of the Salian (W.) Franks, who united a few tribes under his sway (A.D. 448-57). His grandson, Clovis (481-511), extended the power of the

dynasty, which flourished until 639, and finally gave place to the Carlovingians about 751. See F. J. de Pétigny, *Etudes sur . . . l'époque mérovingienne*, 1851, and F. Lot, *La Fin du monde antique et le début du moyen âge*, 1927.

Merowé, dist. in the Dongola Prov. of the Anglo-Egyptian Sudan, on the site of Napata, the anct. cap. of Ethiopia. It is the headquarters of the old Dongola Prov., and is famous for its fruit gardens. The M. dist. lies between the third and fourth cataracts of the Nile, and the inhab. depend entirely on the riv. for their livelihood. In the S. parts are considerable numbers of nomads, with herds of camels, sheep, and cattle. Most of the monuments of the Ethiopian period are grouped in the vicinity of M., and there is a museum at M. of Ethiopian statuary and other remains. On the outskirts of the modern tn. are the ruins of a temple built by King Tirhaka. The cemeteries of the anct. tn. were excavated in 1913. Fighting against the Dervishes took place near M. in 1886. Good crops of Amer. cotton, wheat, maize, and durra are grown in the dist.

Merriam, John Campbell (b. 1869), Amer. paleontologist, b. at Hopkinton, Iowa. He taught paleontology at the Univ. of California, and was head of the Carnegie Institute at Washington, D.C. He has written many vols. on prehistoric animals, and is one of the recognised authorities so far as Amer. species are concerned. His *Published Papers and Addresses* appeared in 1938.

Merrick, Leonard (1864-1939), Eng. author, b. at Hampstead and educated at Brighton College. Especially noteworthy are his short stories representative of Bohemian life in Paris. His books include *Cynthia* (1897); *One Man's View* (1897); *Conrad in Quest of his Youth* (1903); *The House of Lynch* (1907); *A Chair on the Boulevard* (1908); *The Position of Peggy Harper* (1911); *The Quaint Companions* (1918); *While Paris Laughed* (1918); *When Lore flies out of the Window* (1902); and *The Man who understood Women and other Stories* (1908). He had the very rare distinction of a collected ed. of his works, with introductions by some of the most eminent contemporary authors, including Barrie, Chesterton, Wells, Granville Barker, W. D. Howells, Nell Munro, Pinero, Maurice Hewlett, W. J. Locke, and J. K. Prothero. This ed. was pub. in 1918.

Merrill, Stuart (1863-1915), one of the two Amers. who have won celebrity as Fr. poets, was b. at Hampstead, Long Island, New York. His infancy was passed in Paris, where he studied at the Lycée Condorcet, returning to the U.S.A. to study law at Columbia Univ., a study which he soon abandoned in order to devote himself to literature. While still in the U.S.A. he pub. his famous *Pastels in Prose* (1890), consisting of trans. from some thirteen Fr. writers then only known as names in America. Returning definitely and finally to France in 1890 he became well known as a master of the intricacies of Fr. poetry. In 1897 he pub.

a collection of his poems up to that date, and followed this with sev. other vols.

Merrill, co. seat of Lincoln co., Wisconsin, U.S.A., on the Wisconsin, 92 m. from the head of Green Bay. There are tanneries and lumber and sash mills. Pop. 8700.

Merrimac, see HAMPTON ROADS, BATTLE OF.

Merrimack, or **Merrimac**, riv. of S. New Hampshire, U.S.A., rising in the White Mts., flowing S. and E.N.E. through N. of Massachusetts to the Atlantic. Its many falls and rapids supply water-power for cotton-spinning, etc. It passes Concord, Manchester, Lowell, Newburyport, and other large ins., and is navigable to Haverhill. Length 180 m.

Merriman, Henry Seton (1862-1903), pen-name of Hugh Stowell Scott, Eng. novelist. For some time an underwriter at Lloyd's, he adopted a literary career (1889) winning success with his Russian story *The Sowers* (1896). Among his best known works are *In Kedar's Tents* (1897); *Roden's Corner* (1898); *The Isle of Unrest* (1899); *The Velvet Glore* (1901); *The Vultures* (1902); *Barlauch of the Guard* (1903); and *The Last Hope* (1904).

Merry Andrew, jester, buffoon, or quack-doctor's assistant at fairs. Thomas Hearne (1678-1735) derives the name from Andrew Horde (*b.* 1549), physician to Henry VIII., who combined immense learning with marked eccentricity. Andrew, however, is a common name in old plays for a manservant, as Abigail is for a waiting-woman.

Merscheid, see OHLIGS.

Merce, or **March**, strictly a fertile dist. of S.E. Berwickshire, Scotland, the name being, however, commonly applied to the whole co. Formerly it denoted all the country between the Cheviots and Lammermuir Hills.

Meresa, well-wooded is. of Essex, England, between the Colne and Blackwater estuaries, protected by a sea-wall. It is some 5 m. long and 2 wide. A causeway connects it with the mainland. It is noted for oysters. Pop. 2000.

Merseburg, tn. of Saxony, Germany, on the Saale, 9 m. S. of Halle. Its noted cathedral dates from the eleventh century. It was once a favourite royal Ger. residence, and contains a Gothic castle (fifteenth century). The bishopric of M. existed from 968 down to the Reformation. Manufs. include machinery, leather, etc. Pop. 40,000.

Mers-el-Kebir (Sp. *mazalquirir*, great port) fortified seaport of Algeria, N.W. coast, 5 m. N.W. of Oran, taken by the Fr. (1830). Pop. 5,700.

Mersenne, Marin (1588-1648). Fr. philosopher, theologian, and mathematician, studied at the college of La Flèche, where he met Descartes, whose views, as expounded in the *Méditations*, he championed throughout his life. Entering the Minim order of friars in 1611 he taught philosophy at the convent at Nevers. His chief works are the *Quæstiones celeberrimæ in Genesim* (1623; a commentary on chap. vi. of Gen., and an attack on atheism); a philosophical and

theological refutation of the Deists (1624); miscellaneous dissertations on theology, physics, and mathematics (1634), wherein M. discusses the possibility of flying, the velocity of light, etc.; *Les Méchaniques de Galilée* (1634); and *L'Harmonie universelle* (1636).

Mersey, John Charles Bigham, first Baron (1840-1929). Eng. judge, b. at Liverpool. Educated at Liverpool Institute, and also in Berlin and Paris, he was called to the Bar in 1870, and became judge of the king's bench div. of the high court 1897-1909, and president of the probate, divorce, and admiralty div. of the same court 1909-10. He sat in Parliament as a Conservative 1895-97, and was president of the Railway and Canal Commission, 1904-8. He was president in 1912 of the commission appointed to inquire into the circumstances attending the loss of the S.S. *Titanic*.

Mersey, riv. rising in N. Derbyshire, England, formed by the confluence of the Etherow and Goyt in Derbyshire, flows W. between Cheshire and Lancashire, passing Stockport and Warrington, out into Liverpool Channel or harbour, an arm of the Irish Sea. Its length is about 70 m., and the estuary is 16 m. long. Chief trib., the Irwell from Manchester. In spite of sandbanks the riv. is second only to the Thames in commercial importance. Near Irwell on the estuary it is joined by the Manchester Ship Canal. Beneath it is the M. tunnel, for road traffic between Liverpool and Birkenhead, opened in 1934. The railway tunnel was opened in 1886. See J. E. Allison, *The Mersey Estuary*, 1949.

Mersina (Iscl), seaport in Asiatic Turkey, in the vilayet of the same name, 36 m. S.W. of Adana, with which it is connected by rail. It has an extensive trade, and exports wool, cotton, fruit, cereals, and timber. Pop. (vilayet) 280,100, (tn.) 30,200.

Merthyr Tydfil, or **Tydfil**, co. and parl. bor. and markt. tn. of Glamorganshire, S. Wales, on the Taff, 24 m. N.N.W. of Cardiff. It is the centre of the iron and steel industry of S. Wales, with large collieries adjacent. The eccles. par. of Dowlais forms part of the bor. (see DOWLAIS). Brewing and flannel weaving are minor industries. M. T., with Aberdare (pop. 49,000), which forms part of the parl. bor., returns two members to the House of Commons. It was made a co. bor. in 1907. Pop. 61,800.

Merton, Walter de (*d.* 1277), in all probability b. at M., Surrey. In 1261 he was made lord chancellor, and founded M., the first of our Eng. colleges at Oxford (1264-74), when he became bishop of Rochester, and retained that see till his death three years later. See Hobhouse, *Walter de Merton*, 1859.

Merton, vil. in Surrey and suburb of London, 8 m. S.W. of Westminster, forming with Morden a bor. constituency. It was associated with Nelson, who is commemorated by a hospital. Pop., with Morden, 67,600.

Merton College, Oxford, founded in 1264 by Walter de M. (q.v.), is the oldest

college in Oxford. The original endowment was the income from the founder's house and estate at Malden, Surrey, which went to the support of the Oxford scholars. The buildings are among the oldest and most interesting in Oxford. The choir of the church dates from 1294; the small treasury (1310) is among the earlier parts of the college; the large chapel was once used as a par church, and contains some fine stained glass. The fourteenth-century library is the most ancient extant medieval library in England. The old city wall partly encloses the college and the garden. There are some well-designed new buildings. St. Alban Hall, once a separate foundation, was incorporated

blackbirds, thrushes, dippers (*Cinclus*), orioles (*Oriolus*), pittas (*Pitta*), rock-thrushes (*Petrocincla*), and other dentirostral genera. Vigors places this family between the Laniidae or shrikes, and the Sylviidae or warblers.

Merulius, genus of fungi. *M. lacrymans* is the destructive fungus which causes dry rot of timber. It can be avoided by assuming adequate ventilation.

Merv, or Meru, tn. and oasis of the Turkmen S.S.R., situated on the caravan road between Meshed and Bokhara, in the valley of the Murghab, about 300 m. S.E. of Khiva. The tn. is on the Transcaspian railway. Over 1470 sq. m. of the oasis are under cultivation, yielding plentiful



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MERTON COLLEGE
In the foreground is Merton Field.

with M. in 1882. The warden is its head, and its scholars are known as 'post-masters.' Past members include Wycliffe, Bodley, Carew, Antony Wood, Richard Steele, Harvey, Hartley Coleridge, Sir Max Beerbohm, and T. S. Eliot. See lists of the college by B. W. Henderson, and J. H. White; P. S. Allen and H. W. Garrod, *Merton Monuments*, 1928; and F. M. Powicke, *The Mediaeval Books of Merton College*, 1931.

Méru: 1. Tu. in the dept. of Oise, France, 15 m. S. of Beauvais, and 25 m. N.N.W. of Paris. Manufs. include toys, chess pieces and boards, etc. Pop. 5000. 2. Mt. in Masailand, E. Africa, lying 40 m. W.S.W. of Killimanjaro. It has an altitude of about 15,500 ft. and a surface crater.

Meru, in Hindu mythology, a fabulous mnt., the abode of Vishnu. It is the most sacred of all mythical mts., is supposed to stand at the centre of the world, and to be 80,000 leagues high.

Meru, Turkmenistan. see MERV.

Merulidae, family of birds embracing the

crops of millet, rice, wheat, barley, and cotton. The majority of the inhab. are Tekke Turkomans, but many Armenian merchants have taken up their abode in the modern city. The old tn. was originally founded by Alexander the Great, but, having been destroyed, it was rebuilt by Antiochus I., and received the name of Antiochia Margiana. The captive soldiers of Crassus were settled here by Orodes. In after times it was one of the four imperial cities of Khorasan, and many of the Persian monarchs made it their cap., but in 1786 it was taken and sacked by the Uzbeks, a blow from the effects of which it has never recovered. The surrounding country, which bears the name of Maroehak, is celebrated for its fruits, but the climate is very hot and dry. The ruins of the old tn. lie 18 m. N.E. of the present Russian city, which is important owing to its strategic position. The country became Russian in 1883. Pop. of oasis 253,000; of tn. 30,600.

Merville, tn. in the dept. of Nord

France, at the junction of the Bourre Canal with the Lys, 8 m. S. of Hazebrouck and 20 m. W. of Lille. It is a well-built tn., and has important manufs. of damask, linen, and embroideries; there are also salt refineries, breweries, and brick works. Pop. 5000.

Merxem, see MERKSEM.

Méryon, Charles (1821-68), Fr. etcher, b. at Paris. His works include 'Le Pont du Change,' 'Abside de Notre Dame,' 'La Vieille Morgue,' and 'Stryge.' See monograph by Hurty, 1879.

Merzifun, see MARSIVAN.

Merzig, tn. in the Rhineland Palatinate, Germany, 22 m. S. of Trier, has an anc. church and tn. hall. Manufs. include woollens and terra-cotta. Pop. 10,000.

Mesabi Mountains, range in St. Louis co., Minnesota, U.S.A., and one of the largest iron-producing dists. of the world, with an ann. output of about 12,000,000 tons.

Mesagne, tn. in the prov. of Lecce, Italy, 12 m. S.W. of Brindisi. There are exports of olive oil, fruit, wine, etc. Pop. 12,000.

Mesana, tn. in Gujarat, Bombay Prov., India, 40 m. N. by W. of Ahmadabad. Pop. 12,000.

Mesdag, Hendrik Wilhelm (1831-1905), Dutch marine painter, b. at Gröningen. He was a banker till 1867, when he took up art and studied under Alma Tadema and Roelofs at The Hague. He set himself to convey the idea of immensity and boundless space in the sky and sea, representing water-masses and motions most successfully. His pictures include: 'Fishing Boats at Scheveningen,' 'Morning on the Scheeldt,' 'In Peril,' and numerous views of the North Sea. They are to be seen at the Luxembourg, Paris, and in The Hague museums.

Mesembryanthemum, or *Fig Marigold*, genus of succulent plants with thick fleshy leaves and brilliant flowers. Some species are half-hardy in dry sunny positions. *M. crystallinum*, or ice plant, is a trailing annual bearing white flowers in summer and frosted leaves and stems. A number of species of herbaceous and shrubby habits are grown in the greenhouse.

Meseritz, tn. in Poznan, Poland, 42 m. E. by S. of Küstrin. Pop. 6000.

Mesched, or *Mashhad*, cap. of the prov. of Khorasan, N.E. Persia, 195 m. N.W. of Herat, Afghanistan. It is a walled city, situated in a fertile plain, and is famous for the magnificent mausoleum of the Imam Riza, visited annually by Shiite pilgrims. Its isolated position has allowed it to remain a centre of reaction against the progressive policy of the shah. But a branch of the Transiranian railway has been planned to link up M. with other centres, and it has a wireless station. Fruit is canned there. There is a court of appeal, an Amer. hospital, and a military secondary school. Manufs. include silks, velvets, carpets, shawls, worked metals, etc. A staging point on the supply route from India to Russia, M. was occupied by Russian forces from 1941 to 1946. Heavy fighting took place in the post-war Persian revolt. Pop. about 176,000.

Mesched Ali, or *Nejef*, walled tn. of Iraq, near Bagdad. It contains the tomb of Ali, and is a place of Shiite pilgrimage.

Mesitylene ($1:3:5$, or symmetrical, trihydrobenzene, $C_6H_3(CH_3)_2$), an aromatic hydrocarbon found in small quantities in coal tar. It is best prepared by distilling acetone with sulphuric acid. M. is a colourless, mobile, pleasant-smelling liquid boiling at 164.5° C. Treated with concentrated nitric acid it yields mono- and dinitroethylene, but with dilute nitric acid it yields acids by the successive oxidation of the methyl groups.

Mesmer, Franz, or *Friedrich-Anton* (1733-1815), founder of animal magnetism (q.v.), or mesmerism (see HYPNOTISM); graduated M.D. at Vienna in 1766. About 1772 he began, along with Father Hell, to investigate the curative powers of the magnet, and was led to adopt the opinion that there exists a power similar to magnetism which exercises an extraordinary influence on the human body. He pub. an account of his discovery in 1775. In 1778 he went to Paris, where his auto-suggestive system obtained the support of members of the medical profession; but he refused two offers, one of an ann. pension of 30,000 livres and the other of 340,000 livres, to reveal his secret, and this induced the gov. to appoint a commission, whose report was unfavourable. He then fell into disrepute, retired to Meersburg, and spent the rest of his life in obscurity. His historic *Mémoire sur la découverte du magnétisme animal*, otherwise called 'The Dissertation,' appeared in 1779. In it M. refers to his paper, *Disputation de Planetarum Influviis* ('Concerning the Influence of the Planets'), which he publicly read on May 27, 1766, and for which the faculty of Vienna Univ. awarded him his doctor's diploma. This paper, the title of which was later extended by the additional words in *corpus humanum* ('on the human body'), contains the germ of his famous Twenty-seven Propositions (also recorded in the Dissertation) relating to animal magnetism. Present-day spiritualism, in so far as it is based on the evidence of mediums, owes some debt to M., and equally so does the Church of Christ Scientist. How far M. himself was indebted to the iconoclast Paracelsus (1493-1541) and to van Helmont (1577-1644), raised interesting speculation. See on this Gilbert Frankau's introductory monograph to the first Eng. trans. of the *Mémoire*, 1948. See also life by A. J. Kerner 1856, and study by Graham, 1890.

Mesmerism, see HYPNOTISM.

Mesne (middle, intermediate): *M. profits*, in law, the profits received by a tenant in possession during the period for which he has wrongfully kept the lessor out of possession. In actions for the recovery of land by a landlord against a tenant whose term has expired, or has been duly determined by a notice to quit, or against persons claiming possession under such tenant, a claim for *M. profits* may, by the rules of the supreme court, be joined on a specially endorsed writ under Order XIV., together with the

Liquidated claim for possession, the merit of the procedure under this order being that it is both summary and speedy, and the defendant, unless he has some sort of defence, will only get leave to defend the action at all on terms, as, for example, by giving security.

M. process, in law, that part of the proceedings in a suit which intervenes between the original process or writ and the final issue, and which issues pending the suit on some collateral matter. It is sometimes used to denote the whole process which issues prior to actual execution.

M. lord, in the feudal system, a lord who held land of a superior lord, but who granted away a part of it to another person; he was thus tenant to the superior, but lord or superior to his own grantees.

Mesolithic, see STONE AGE.

Mesolonghi, or **Mesotrons**. Observations dating from the early years of the present century showed that the earth's atmosphere is continuously bombarded from outside it by a stream of radiation with a quite exceptional power to penetrate through considerable thicknesses of matter. This is called the cosmic radiation (*q.r.*). In recent years it has become apparent that the primary radiation that impinges on the upper atmosphere consists chiefly of protons, or nuclei of hydrogen atoms, travelling at enormous velocities, but accompanied also by nuclei of other types, in approximately the same proportions as the different chemical elements occur in the universe.

Atomic nuclei are positively charged, extremely minute structures, built up of protons and neutrons (see ATOM). In consequence of their like charges they repel one another as they approach, and, unless their speeds are very high, collisions between them do not cause disruption of their structures. If, however, their speeds are as great as those of the α particles emitted from radioactive materials, or produced artificially in such machines as the cyclotron (*q.v.*), collisions between nuclei may be violent enough to cause changes that transmute nuclei of one type into those of another element. The speeds of the protons in cosmic rays, however, are much higher than any yet produced in the laboratory or by radioactive material, and as their collisions with other nuclei are correspondingly more violent, they produce changes of an entirely different type. Little is yet known of the structure of nuclei, and of the forces that hold them together, and it is because such knowledge can at present only be obtained by the study of these violent collisions that the investigation of the cosmic rays is so important.

When the stream of protons passes into the earth's atmosphere their impacts with nuclei of atoms of the air cause the more or less complete disruption of the latter, and in these collisions particles called *M.* are released. As their name implies, these are particles whose mass is intermediate between that of the proton and that of the electron; their masses are, in fact, 286 times that of the latter, and

they carry a charge that may be positive or negative. The *M.* produced in this way are called π *M.* (Gk. ρ for 'primary') and they were first identified in 1947 through the changes they produce in photographic plates while passing through the photographic emulsion. They are very short-lived, and on average exist for only about one hundred-millionth of a second. When brought to rest by collisions with other matter, the negatively charged π *M.* are drawn into atomic nuclei, where the energy corresponding to their mass is imparted to the components of the nuclei, and causes them to explode. The positively charged π *M.*, on the other hand, disintegrate spontaneously, forming a neutral particle that is shot off at high speed, together with a high-speed meson of a different type, called a μ meson. This has a mass 216 times that of the electron, and after a life-time of about two millionths of a second, it is further transformed into two neutral particles and an electron, which are shot out at high speeds.

M., although discovered earlier (1938) than μ *M.*, are thus their lineal descendants. The cosmic rays, then, consist of streams of particles—atomic nuclei, *M.*, and electrons—together with electromagnetic radiation (similar in nature to X-rays) produced by the impact of electrons with the matter in their path. Its constitution, however, changes continually as it passes downwards through the atmosphere, both because certain of its components are more readily stopped by air than are others, and also because some of its components change to other forms during its passage. The means by which the atomic nuclei that impinge on the upper atmosphere acquire their enormous velocities is at present obscure. *M.* have been liberated from the atomic nucleus by means of a 4000-ton cyclotron. See P. M. S. Blackett, *Cosmic Rays*, 1936; R. A. Millikan, *Cosmic Rays and Mesotrons*, 1939; and J. G. Wilson, *About Cosmic Rays*, 1948.

Mesopotamia (Gk. Μεσοποταμία, from μέσος, middle, ποταμός, river), land between the two rvs., i.e. the Euphrates on the W. and the Tigris on the E. The dist. to which the name has been applied prior to the delimitation of the modern kingdom of Iraq, is rather loosely defined; with some it refers to the whole riv. country which stretches eastward from N. Syria to the mountainous tract of country dividing Persia (Iran) from the steppes and plains at the head of the Persian Gulf. With others it includes the whole of the country once ruled by the Babylonian and Assyrian empires. Strictly it may be confined to the dist. of the former Turkish dominions in Asia which was known as El-Jezireh (Syriac *Gazirtha*, is.) from Samosata (modern *Samait*) on the Euphrates to where that riv. approaches the Tigris above Bagdad at the point of the great wall, the so-called Median wall, built, like the Chinese wall, as a protection against the nomad tribes of the N. For the physical features, gov., commerce, etc., see IRAQ.

History.—A letter of an Egyptian

Lieutenant of Thothmes I. of Egypt speaks of *Nakarin* in the late sixteenth century B.C., thus giving the earliest Semitic name of a dist. somewhere on the Euphrates or beyond. This name occurs again at the place whence came a wife for Isaac (Gen. xxiv. 10). Harran (Carrae) is closely connected with the early hist. of Abraham. This hist., however, goes far back beyond these dates. We know from inscriptions that an early Babylonian king, Zugallagziggisi, spread his kingdom through M. as far as the Mediterranean. How the Semitic invasions of the third millennium reached Babylonia is not certain. It is possible that one wave came down from the N. through M. and caused the earliest building of the so-called Median wall.



E.N.A

A TIGRIS LANDSCAPE

The N. Babylonian king, Sargon of Akkad (Agade), somewhere during the third millennium reduced M. in his relations with the W., and must have brought much cultivation and trade intercourse to the country. About this time, too, we hear of the Amurru (Amorites) of N. Syria.

It seems that in face of this immigration Khammurabi, or Hammurabi, the author of the great Babylonian code of laws, occupied M., and was suzerain in Asshur (Assyria), which now becomes prominent. Later the Amorites, evidently from N. Syria, gave way before a N., probably Hittite, movement. About 1750 B.C. the Babylonians were invaded by the Kassites from Elam, the mountainous dist. on the E. border, and lost their W. and N. dominions, allowing also the rise of Assyria, whose chief city was at Calah (Nimrud), on the E. border of M. Another state also comes into prominence, that of Mitanni, whose power extended to Assyria. It acted as a buffer state between Egypt and Assyria, lying as it did across the

N.W. parts of M. and barring the way to the road through Palestine to Egypt. Through the long epoch of the rise of the Assyrian empire, with its periods of unquestioned supremacy, decline, and recovery, M. was at the mercy of the warring powers, its kings asserting their independence at times, such as on the defeat of Tiglath-pileser I. about 1107 B.C. in Babylonia, and yielding again when Shalmaneser II., 853 B.C., shattered the confederacy of the N. Syrian and Israelite princes. Colonies of Assyrians were then settled in M. In 729 B.C. Tiglath-pileser III. of Assyria was acknowledged supreme from Babylonia to the Mediterranean. Under his rule, his dominions were strictly organised, and a strong central gov. was estab. He broke the Hittite power in N. M. and in Armenia. The powerful empire of Esar-haddon, 680, crumbled before the irruption of the Medes who sacked Nineveh in 606. For the fall of the Median empire and the rise of Cyrus, see PERSIA. The estab. of the Seleucid kingdoms after the death of Alexander the Great brought many Gk. settlements, Islam and the founding of the caliphate of Bagdad brought a new culture, and the later period that of the Ottoman Turks and the incorporation of M. in the Turkish empire, to which it belonged up to the time of the First World War. See also ASSYRIA; BABYLONIA. For the modern hist. see IRAQ. For archaeology see ASSYRIA; BABYLONIA; UR.

First World War Campaigns in Mesopotamia.—The strategical importance of Iraq (M.) to the central powers during the First World War was that it offered an all-land route to India, via Persia and Afghanistan, so as to obviate the menace of the Brit. fleet. Its political importance lay in the influence the occupying nation had with the inhab., coupled with the control of the oil wells. Great Britain having declared war on Turkey on Nov. 5, 1914, the 16th Indian Infantry Brigade, under Brig.-Gen. Delamain, landed at the mouth of the Shatt-el-Arab on the 8th. A few days later Gen. Barrett, commanding the 6th Indian Div., arrived with the remainder of his command and moved on Basra, the key to M., which he took on Nov. 22, after defeating a combined Turkish and Arab force. The rapidity and decisiveness of the Brit. action impressed the inhab., and Brit. prestige was considerably raised. A further advance was made to Qurna, which fell on Dec. 9.

Gen. Sir John Nixon assumed command on April 8, 1915. During that month the 12th Indian Div. arrived: the Turks also had been reinforced. Gen. Barrett had placed two infantry brigades and one cavalry brigade at Shalba to cover Basra from an attack on his left. The Turks attacked the post on April 12, 13, and 14 with great fury, but were defeated despite their superior numbers. Gen. Nixon decided to follow up this victory, and ordered Gen. Townshend to move on Anura. Townshend accordingly advanced on May 31, 1915. His force was conveyed in native boats known as "hellums" bro-

tected by a naval flotilla of gun-boats, Gen. Gorringe was protecting the right flank with a force of all arms. Townshend entered Amara on June 3, without firing a shot, and captured four officers and 800 men. The next advance was on the Euphrates, where Gorringe captured Nasiriyeh on July 25. Nixon now planned to take Kut to deprive the enemy of an advanced base against him. His project was approved, and Townshend was ordered to carry it out, which he did during Sept., entering Kut on the 30th, driving the enemy before him. The Turks went direct to Ctesiphon (*q.v.*) and occupied a prepared position. The next objective was Bagdad. News of German reinforcements, under Gen. von der Goltz, for the Turks reached Nixon and he ordered Townshend to advance on Bagdad to outstrip the enemy's reinforcements. On Nov. 22 Townshend met the enemy at Ctesiphon, but their reinforcements had arrived, and he was outnumbered, and after suffering heavy casualties, withdrew to Kut again. The Turks followed him and besieged Kut, which fell to them on April 29, 1916, and Townshend and 2700 Brit. and 6500 Indian troops were taken prisoners (*see also KUT AL AMARA*).

Gen. Sir Stanley Maude assumed command of the Mesopotamian expeditionary force in Aug. 1916, and at once organised a fresh forward move, which commenced on Dec. 10. His plan was to surprise the enemy by moving at night and to push forward on the r. b. of the Tigris to capture the line of the R. Hal. This was completely successful, and Maude pushed on up the Tigris until he captured Bagdad on March 11, 1917. He d. on Nov. 18 in the same house in which Gen. von der Goltz had d. a year previously. He was succeeded by Gen. Marshall, who had been commanding the 3rd Corps. In Jan. 1918 the 'Dunster force' (*see under Dunsterville*) set out from Bagdad. In Sept. Gen. Marshall moved forward, co-operating with Gen. Allenby in Palestine, and his force was in sight of Mosul when the armistice was declared. See E. Candler. *The Long Road to Bagdad, 1919*; K. Roosevelt, *War in the Garden of Eden, 1920*; Maj.-Gen. Sir C. V. F. Townshend, *My Campaign in Mesopotamia, 1920*; F. J. Moberly, 'The Campaign in Mesopotamia' in *Official History of the Great War, 1923-1927*; Vice-Adm. W. Nunn, *Tigris Gun-boats, 1932*; and Maj. R. Evans, *A Brief Outline of the Campaigns in Mesopotamia, 1914-18, 1935*.

Mesozoa, group of lowly animal organisms intermediate between the Protozoa or unicellular organisms, and the Metazoa, or those of many-celled structures. The best-known types are the family Dicyemidae, which are ciliated thread-like organisms found parasitic in the kidneys of cuttlefish.

Mesozoic, subdivision of geological time, between the Palaeozoic and the Cainozoic; it includes the Triassic, Jurassic, and Cretaceous systems, which cover much of England, France, N. Germany, the Alps, and the W. states of America. The M. ages appear to have been unbroken by

volcanic eruptions, and in this respect as well as in their fauna and flora differ from the Palaeozoic ages. Cycads and conifers represented the early M. flora, and later monocotyledons flourished. In the animal world great changes took place. Brachiopods diminished in number, as also did the Crinoids, while the Echinoderms, as represented by the Urchins, occupied a prominent position. The Ammonites were the typical M. cephalopoda, and the variety and abundance of reptilian life constitute a remarkable feature of the life of the period. The first mammals made their appearance in marsupial forms during the M. time, and the first species of bird, *Archaeopteryx macrura*, has been found in the Jurassic rocks of Germany. (See illustration, p. 176.)

Mess (O.F. *més*, modern: *mets*, dish), in its original meaning, a portion of food, or provision of food for a party for one meal. It was especially applied in early times to more or less liquid food, such as porridge, soup, or broth (*cf.* the biblical 'mess of potage'). The term is now used of a company of persons who sit at meals together, especially of the members of an official or professional body. At one time the number in a M. was usually a small group of about four, seated at one table and sharing the same dishes. In the Inns of Court parties of four benchers or four students are still common, but in the naval or military service the number in a M. is considerably larger, consisting of the parties into which a ship's company or a regiment is divided for meals. Most ships in the Brit. Navy have the officers' or ward-room M., the junior officers' M., and the warrant officers' M. The admiral and the captain usually take their meals alone. Similarly in the army there are officers' and sergeants' Ms., and separate Ms. for the men. The M. is generally managed by a committee of officers and supported by the joint subscriptions of the members, supplemented by a small yearly allowance from the gov. There is often a small monthly subscription for newspapers, magazines, and washing. Meals are served in the barracks; but married men are allowed to dine at home, and there are sometimes certain exemptions for others. The senior officer present is responsible for the discipline. Billiards, smoking, and reading rooms are often attached to the M. house, as well as the 'common room' or dining-hall, kitchen, and cellars.

Messager, André (1853-1929). Fr. operetta composer, pupil of Saint-Saëns, was known by his operettas and comic operas, of which *La Blârnaisse* (1885) was his first marked success. His others were *La Basoche* (1890); *Madame Chrysanthème* (1893); *Mirette* (written for the Savoy Theatre, London, 1894); *Les Petites Michus* (1897); *Véronique* (1898); *Fortunio* (1907); *Monsieur Beaucaire* (1919); and *L'Amour masqué* (1923). From 1901 to 1906 he was artistic director at Covent Garden, and from 1907 to 1914 at the Opéra in Paris. Debussy dedicated his *Pelléas et Mélisande* to him. See life by L. Beydts, 1947.

Messageries Maritimes, chief passenger steamship line in France, with headquarters at Marseilles, and London offices at 97 Cannon Street, E.C. Before the Second World War it had a fleet of sixty-five steamers, aggregating 293,669 tons. It trades with the Levant and Black Sea, carries mail to Italy, Egypt, Syria, Greece, India, China, and Spain, and includes a service to Australia and S. America and the S.E. coast of Africa.

orator, but none of his works is extant. His friendship for Horace and his intimacy with Tibullus are well known. In the elegies of the latter poet the name of M. is continually introduced. Of M.'s many works, oratorical, historical, grammatical, and poetical, some of the titles alone remain. Yet some estimate of his literary merit may be formed from the testimonies of his contemporaries and successors.

Messalina, Valeria, daughter of Marcus



MESOZOIC PLANTS

1-6, cycads; 7 and 8, conifers. 1. Stem of *Cycadoidea superba*, South Dakota; 2. Leaves of *Zamites feneonis*, France; 3. Leaves of *Otoxamites beari*, England; 4. Leaf of *Nelsonia polymorpha* (Triassic); 5. Leaf of *Zamites articus*, Greenland; 6. Cone of *Williamsonia gigas* (Liassic); 7. *Voltzia heterophyllas*; 8. *Araucaria microphylla* (Jurassic). After Wieland, Saporta, Nathorst, Heer, and Schumper.

Messala, or Messalla, name of a distinguished family of the *Valeria* gens at Rome. The first who bore the name of M. was *Marcus Valerius Maximus Corrinus M.*, consul 263 B.C., who carried on the war against the Carthaginians in Sicily, and received this cognomen in consequence of his relieving Messina. The most celebrated member of the family was *Marcus Valerius Corrinus*. He fought on the republican side at the battle of Philippi (42 B.C.), but was afterwards pardoned by the triumvirs, and became one of the chief generals and friends of Augustus. He was consul 31 B.C., and proconsul of Aquitania 28, 27. He d. about 3 B.C.-A.D. 3. M. was a patron of learning, and was himself an historian, a poet, a grammarian, and an

Valerius Messala Barbatus, and wife of the Iton. emperor, Claudius, a woman infamous for her lasciviousness, her avarice, and the atrocities which she perpetrated. Taking advantage of the weakness and stupidity of the emperor, and exercising an unbounded empire over him, she played the adulteress without restraint, and relentlessly caused all to be put to death who stood in the way of her unhallowed gratifications. The best blood of Rome flowed at her pleasure. Among her victims were the daughters of Germanicus and Drusus, Justus Catonius, Marcus Vincius, *Valerius Asiaticus*, and her confederate Polybius. She went so far in vice as to offer her charms for sale like a common prostitute, and at last, during a temporary absence of the emperor at Ostia

(A.D. 48), she publicly married one of her favourites, C. Silius, upon which Narcissus, one of the emperor's freedmen, fearing danger to his own power, represented to the emperor that M. was aiming at his destruction, and received orders for her execution. She was put to death by Enodus, a tribuno of the guards, in the gardens of Lucullus, A.D. 48.

Messapii, see APULIA and IAPYGIA.

Messene, cap. of Messenia in Greece, founded by Epaminondas in 369 B.C. Erected as a check to the power of Sparta, it was strongly fortified. Pausanias describes it. The site is now occupied by the vil. of Maurotati.

Messengers, King's or Queen's, are officers of the Brit. Gov., who are appointed or held in readiness to carry official dispatches, both at home and abroad. They are employed under the secretaries of state.

Messenia, country of anc. Greece, was bounded on the E. by Laconia, on the N. by Elis and Arcadia, and was surrounded by the sea on the W. and S. sides. It was separated from Laconia by the mt. chain of Taygetus, and from Elis and Arcadia by the R. Neda and the high land which runs between the bed of the Neda and the sources of Pamisus. M. is described by Pausanias as the most fertile prov. in the Peloponnesus. The W. part of M. is drained by the R. Pamisus, which rises in the mts., between Arcadia and M., and flows southward into the Messenian bay (gulf of Koroni). The basin of the Pamisus is divided into two distinct parts. The upper part, usually called the plain of Stenyclerus, is of small extent and moderate fertility, but the lower part S. of Ithome is an extensive plain, celebrated in anc. times for its great fertility, whence it was frequently called Macaria, or the 'Blessed.' The W. part of M. is diversified by hills and valleys, but contains no high mts. The chief tns. on the W. coast were Pylos and Mothone, or Methone (Modon). The bay of Pylos (Navarino), which is protected from the swell of the sea by the is. of Sphacteria (Sphagia), is the best harbour in the Peloponnesus. The only tn. inland of any importance was Messene, at the foot of Mt. Ithome, on the summit of which was the citadel. The country is now a prefecture of Greece (cap. Kalamata, pop. 28,000), and produces fruit in abundance. Pop. 297,200.

Messenius, Arnold Johan (1608-51), son of Johan M., was historiographer to Christina of Sweden (1646), and ennobled (1647). Arnold and his son were executed for writing a libel on the royal family. See *Anecdotes de Suède* (The Hague), 1716.

Messenius, Johan (c. 1579-1636), Swedish historian and dramatic author. The Emperor Rodolphe made him *porta Caesaris*, and he became prof. of law at Upsala Univ. (1609). He was imprisoned (1616) on a charge of treasonable correspondence with the Jesuits. His chief historical work, *Scandinavia illustrata*, was written in confinement. Other works were *Chronicon episcoporum oer Sueciam . . .* (1611), and the dramas *Disa* (1611) and *Signill* 1612. See P. Stenbeck, *De Vita et Meritis Mes-*

seniorum, 1741, and *Biographiskt-Lexicon öfver rämnkunnige Svenska Män*.

Messerschmitt, Wilhelm (b. 1898), Ger. aircraft designer and maker. He designed his first aeroplane in 1916 and estab. a manufacturing firm under his own name a few years after the First World War. He was chief engineer of the Bayerische Flugzeugwerke (Bavarian Aircraft Works) until it was absorbed in 1938 by the M. Company. M. received the Lilienthal prize for research in aviation, 1937. His Mo. 109, after sev. developments, emerged as a standard Ger. single-seat fighter of the 1944-45 period; carrying two machine guns and three 20 mm. cannon, its speed was 428 m.p.h. and its ceiling nearly 40,000 ft. Twin-engined fighter bombers were represented by the Me. 110, 210, and 410. The tailless rocket-propelled fighter monoplane, Me. 163 (see AEROPLANE) was the first operational type capable of over 550 m.p.h., but was not a very great success; the 262, a twin-engined fighter, was the best Ger. jet-propelled aircraft.

Messiah (Gk. Μεστίας, Aram. *Mēshīdā*, anointed - Gk. Χριστός), title applied to Jesus as fulfilling the long-continued hope of the Jews for a king who should be a deliverer, kings being anointed in Israel. The messianic idea was of comparatively late development among the Hebrews, and in its later form dates only from the Exile. Before this the M. was regarded as purely human. See J. Drummond, *Jewish Messiah*, 1877; V. H. Stanton, *Jewish and Christian Messiah*, 1886; C. H. Briggs, *Messianic Prophecy*, 1886; and M. J. Langrange, *Le Messianisme chez les Juifs*, 1909. See also J. K. JWKS, and the article in J. Hastings's *Dictionary of the Bible*, 1898.

Messina, Antonella da, see ANTONELLO.

Messina, city of Sicily, cap. of the prov. M., on the strait of M., about 8 m. N.N.W. of Reggio. Formerly a beautiful and flourishing city, it was totally destroyed in 1908 by an earthquake. Its original name was Zanclo (Ζάγκλον, the Sicilian equivalent of the Gk. Ζάγκλον). The harbour is one of the best in the world, and, not being damaged by the earthquake, can still carry on an extensive trade, the chief exports being oranges and lemons. Of the univ. only the law faculty has been reopened, but the valuable Gk. MSS., which were in the library, were saved, as well as some of the treasures of the Museo. The cathedral, which dated back to the Norman period, was almost totally destroyed, but the statue of Don John of Austria, in the Corso Cavour, still remains. M. was founded by pirates from Cumæ in the eighth century B.C. During the Punic wars it was a Rom. naval station. In 1072 the Normans expelled the Saracens, who had held possession for over 250 years. A little over a century later M. belonged to the house of Hohenstaufen, under the Emperor Henry VI., and in 1282 it passed to Spain, who held possession until 1713. Great damage was done to the city in 1848, when it was taken by the Neapolitan troops, after a fierce bombardment of

five days. The city was visited by a plague in 1743, when 49,000 people were carried off, and it has also suffered severely from earthquakes, the most disastrous occurring in 1908, which destroyed the city and involved a loss of 100,000 lives, a total only exceeded by the Syrian earthquake of A.D. 526, and the Jap. earthquake of 1923 in which 150,000 perished. Pop. 215,190.

In the Second World War the city was a constant target for allied bombers and suffered heavily. The cathedral was badly damaged, but its early Gothic façade, with figures by Mazzola, was relatively unspoiled. The apse and its fourteenth-century mosaics were ruined; together with the side chapels and their statues of the apostles by Montosorli. Work on the reconstruction of the façade was completed in 1946. Other churches damaged were the Annunziata dei Catalani, which, however, remained structurally sound, S. Elia and S. Giovanni di Malta. The old city wall of the port was destroyed and the statue of Neptune was injured.

Messina, Strait of (ancet. Mamertinum Fretum), separates Sicily from Italy, and has a length of 24 m. with a breadth varying from $2\frac{1}{2}$ m. to 12 m. Hero are to be found the Scylla and Charybdis of Gk. mythology, the former a rock off the small tn. of Scylla, the latter a rapid or whirlpool in front of the harbour of M.

Messines Ridge, spur of rising ground 6 m. S. of Ypres, Belgium, captured by the Gers. in the First World War after severe fighting in Nov. 1914, and the scene of further fighting in June 1917 and April 1918. See FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGNS IN.

Mestre, tn. of Italy, in the prov. of Venice, situated on a lagoon 6 m. N.W. of the city of that name. There are sawmills and foundries, and the tn. is an important railway junction. Pop. 28,500.

Mestrovic, Ivan (b. 1883), Croat sculptor, b. at Vrpolje in N. Dalmatia. A peasant's son, he tended sheep as a boy, was taught wood-carving by his father, apprenticed to a marble-cutter at Spalato, and studied sculptures at Vienna. He designed the Serb national temple for Kossovo; two equestrian statues in bronze of Amer. Indians for Chicago city; portraits of Masaryk, Hoover, Plus XI; the memorial chapel to the unknown soldier on Avala Mt., Belgrade, etc. There is a torso by him in the Victoria and Albert Museum, London.

Meta: 1. Intendancy of Colombia, with Yichada to the E., Boyaca to the N., Cundinamarca and Huila to the W., and Vaupés to the S. The cap. is Villavicencio. Area 32,895 sq. m. Pop. 52,100. 2. Riv. of Colombia, S. America, which rises in the Sumapaz glacier, 40 m. S. of Bogota. It flows N.E. to the Orinoco, after a course of about 650 m.

Meta, trade name for metaldehyde, a polymer (*q.v.*) of acetaldehyde (*q.v.*). It is used as a solid fuel in spirit lamps and stoves, and mixed with bran, as a slug and snail destroyer.

Metabolism is the sum total of the chemical changes within living organisms.

These changes are of two kinds: (1) synthetic or anabolic; (2) destructive or katabolic. If anabolism exceed katabolism, growth will result; if katabolism proceed more rapidly than anabolism, reduction or 'wasting' will occur (see GROWTH).

Green plants synthesise proteins, fats, and carbohydrates from carbon dioxide, water, and mineral salts. Animals cannot synthesise from such simple materials, but use the products of plant anabolism, digest and distribute them, and re-synthesise them in various parts of the body. The protein, fat, and carbohydrate incorporated in the cell substance of organisms are not used in normal metabolism. Some of this endogenous material may be used during starvation, but if the material be reduced beyond the minimum essential to the composition of a living cell, the cell will die. The materials used in normal M. are exogenous, i.e. stored in or around the tissues or carried in circulation. Animals and plants gain energy by the oxidation (respiration) of these materials, and carbon dioxide and water are two almost universal products of this katabolic process. The liver of mammals plays a great part in the M. of fats, carbohydrates, and proteins. The pancreas is important as an organ of secretion, forming both pancreatic juice and insulin; if too little or too much insulin be secreted, the normal carbohydrate M. is disturbed, and *Diabetes mellitus* and hypoglycemia, respectively, result. Mammals fed on protein, carbohydrate, and the requisite vitamins can synthesise fat, so that fat is not an essential article of diet, though it is usually regarded as desirable, being particularly useful for the production of energy when it is oxidised. In the tissues of mammals is a considerable amount of fat not rendered visible by the ordinary methods of detection, but when certain toxins are introduced into the body this fat forms visible droplets. The deposition of normally invisible fat is the cause of fatty degeneration. The M. which takes place when the body is given just sufficient food to sustain it during complete rest is termed basal M. (see under DIET), or basal metabolic rate (B. M. R.), and is used as a standard for comparison with M. during disease, e.g. exophthalmic goitre (see PHYSIOLOGY). See E. F. Du Bois, *Basal Metabolism*, 1936; E. Holmes, *The Metabolism of Living Tissues*, 1937; and A. B. Callow, *Food and Health*, 1938.

Metallography, see under METALLURGY (PHYSICAL METALLURGY).

Metallurgy can be defined as the theory and practice of metal treatment. The term embraces the extraction of the pure metal from its ores; the study of the physical and chemical properties of the pure metal; the study of the physical properties of the alloys of two or more pure metals; the study of the various ways in which a metal and its alloys can be rendered into a suitable form and condition for use in the home and industry; and the study of the means of protecting metals and alloys against corrosive agencies. Much of M. is applied physical chem. while some branches are applied chem.

and others applied physics. The numerous aspects of the subject can conveniently be classified under the headings used below:

PHYSICAL METALLURGY attempts to define exactly what a metal is and to correlate its properties with both its fundamental atomic structure and also its crystal structure. In the case of alloys the properties are related to the micro-constituents, known as 'phases,' present. It studies the changes which take place during heat treatment and during deformation, the effect of dissolved gases, of traces of impurity and phenomena associated with solidification. The ideal to which the metal physicist looks is to be able to forecast which metals will alloy together and what will be the properties of the alloys so formed. Conversely should an alloy with given properties be required he aims eventually to be able to indicate what metals to use, in what proportion and what heat treatment will develop the properties most fully. Considerable progress has been made in recent years, but this ideal is still very far from fulfilment. The structures of alloys containing more than three or four metals are so difficult to represent, even in models, that the object may never be attained except for alloys of the simplest kind. To answer the question, 'What is a metal?' one must consider the smallest particle of the metal which can still be identified as the metal, i.e. the atom (see ATOM AND ATOMIC THEORY). The atom consists of a central core called the nucleus which is made up of two kinds of matter; the neutron which is electrically neutral, and the proton which is positively charged. Around the nucleus revolve a number of electrons which are negatively charged. The atom as a whole is neutral, so there must be exactly as many electrons as there are protons so that their charges balance. The lightest element of all, hydrogen, has only one proton in the nucleus and therefore only one electron outside it, but as the weights of the elements increase the number of protons increases, and hence the number of electrons likewise until the heaviest element of all, uranium, has ninety-two of each. The electrons revolve in a number of orbits or shells, each shell being only capable of containing up to a certain maximum number of electrons, hence the number of shells increases with the number of electrons. The first shell will hold only two electrons, the second up to eight, the third up to eighteen, etc. The inner shells fill up before the outer ones begin and, in fact, it is the tendency for atoms to form completed shells that accounts for the properties that makes a metal behave as a metal. The electrons in the partly completed outermost shell are less tightly bound to the nucleus than those in the innermost shells and are quite easily parted with leaving the remainder of the atom positively charged, that is, 'ionised.' Now consider, for example, the atom of an element like aluminium. This has three electrons only in the eight-electron shell and so requires five to fill it, but it is easier to take the alternative course

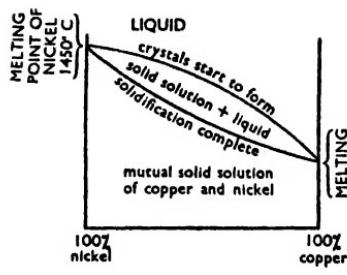
and get rid of the three electrons in order to arrive at the condition of no partly completed shells. This leaves the aluminium ion with three positive charges. Chlorine, on the other hand, only requires a single electron to complete all its shells, and if it manages to acquire one from somewhere the extra electron makes the atom become a negatively charged ion of chlorine. If aluminium atoms and chlorine atoms are now brought together, three chlorine atoms are able to complete their shells by each taking one of the three electrons which the aluminium is able to spare. The positive aluminium ion and the three negative chlorine ions are at once attracted to each other, giving a molecule of aluminium chloride. This, then, is one major distinction between a metal and a non-metal: the metal completes its shells by losing electrons and forming a positive ion, while the non-metal does so by acquiring electrons and forming a negative ion. An element like silicon with four 'valency' electrons, as those in the outermost shell are called, can arrive at the stable state by either losing four or acquiring four electrons, and in actual fact does either according to the circumstances. In the first case it shows metallic properties, in the second case non-metallic properties, e.g. in silicon tetrafluoride it is in the basic part of the compound like a metal, but in sodium silicate it is in the acid part like a non-metal. For other reasons it is classed as a non-metal. Even aluminium forms aluminates as if it were a non-metal. The second distinction between a metal and non-metal concerns the arrangement of the atoms in the crystal. In crystals the atoms are arranged in a regular pattern and are regarded as being located at various positions on an imaginary framework or lattice. In a crystal of a non-metal such as carbon or sulphur the bond between one atom and another results from a sharing of electrons, and it is this which determines the arrangement of the atoms in the lattice. As a result the electrons are tightly bound to the atoms which share them and the crystal is hard and rigid. On the other hand, the electrons of a metal are much more loosely bound to their atoms and can move round the lattice comparatively freely like a cloud of negative charges. It is this ability of the electrons to move through the lattice which enables them to conduct an electric current through the metal and, the loose bonding of the atoms accounts for the ductility of the metal.

Metallic crystals are usually of three types: body-centred cubic, face-centred cubic, and hexagonal close-packed. If atoms of one metal are added to atoms of another to form an alloy, the second metal will generally form a solid solution with the first and the structure will be of the same type as that of the first if only a few atoms are added. As more atoms of the second metal are added a point may arrive when a second phase with a different crystal structure is formed and later, as still more atoms are added, a third and fourth phase may be present. Solid

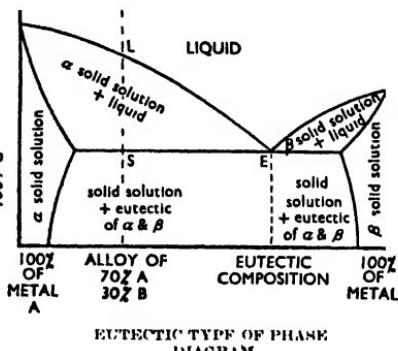
solution phases are, as a rule, very ductile and are therefore required for alloys which have to be cold-formed, e.g. yellow brass for deep-drawing into cartridge cases. Such alloys, however, have not the high strength required for structural purposes, and a composition is chosen which provides a sufficient proportion of a second, more rigid phase; a less ductile solid solution, or, better still, an intermetallic compound. The latter are hard and brittle and provide the rigid skeleton which ordains the alloy with stiffness while the solid solution supplies the ductility which prevents it from breaking under shock. Steel is a good example of this where the compound iron carbide stiffens the soft iron. Research by Ilme-Rothery and others has revealed some of the laws which govern the crystal structure of the various phases which occur in an alloy. It has been found that these depend upon such factors

alternating with layers of the other, or dots of one in a background of the other.

Solidification of a Metal.—A pure metal cooling from the liquid state begins to solidify as soon as the freezing-point is reached only if nuclei (not to be confused with atomic nuclei) such as specks of dust are present to 'touch off,' so to speak, the process of crystallisation. If these nuclei are absent the liquid will 'undercool' well below its true solidification temp.; then suddenly something, perhaps a slight shock, will cause crystallisation to begin and rapidly go to completion, resulting in a mass of very fine crystals. The more nuclei there are present the more crystals there will be, and therefore the smaller they will be. A small number of nuclei and crystallisation at the freezing-point yields coarse crystals. Rapid cooling causes undercooling and therefore induces small crystals, while very slow



NICKEL-COPPER PHASE DIAGRAM



EUTECTIC TYPE OF PHASE DIAGRAM

as the relative sizes of the atoms concerned, the system in which each crystallises, their relative positions in the electro-motive series, and the ratio of electrons to atoms.

Phase diagrams are diagrams in which the various phases in an alloy are represented when the percentage composition is plotted against temp. The simplest is exemplified by alloys of copper and nickel in which a single solid solution is present over the whole range from 100 per cent copper to 100 per cent nickel. It will be noticed that although the pure metals solidify at fixed temps. the alloys have a 'mushy' range in which both solid and liquid are present together. In another very common type of diagram there are two phases present, the α and the β solid solutions. Suppose an alloy consists of 70 per cent of metal A and 30 per cent of metal B. As this alloy cools, the α -solid solution begins to crystallise at point L; at point S the remaining liquid solidifies and consists of both the α and the β solid solutions together in the ratio given by point E. E is called the eutectic. Under the microscope a eutectic has a very characteristic appearance, showing most commonly layers of one solid solution

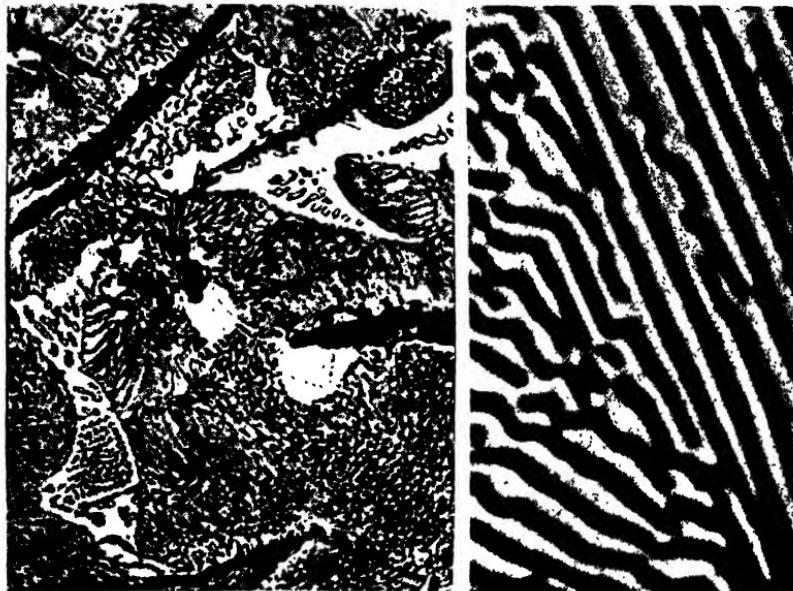
cooling has the reverse effect. Hence the reason why die-castings in metal moulds are fine-grained and large sand-castings are coarse-grained. For most applications fine grains are preferred. The growth of a crystal takes place in a special way. As soon as a nucleus has initiated the formation of a crystal a number of branches spread outwards; soon these begin to grow secondary branches, and these in turn grow their own side-shoots until eventually all the space between the original 'dendrites' is filled in and the whole becomes a crystal, as seen under the microscope. Normally there are numerous small dendritic systems all growing at the same time, so that in due course these touch and no more liquid is left. In an alloy where there are often phases of different freezing-points and low freezing-point impurities the high freezing-point phases always crystallise first and the low freezing-point phases and impurities solidify last in the grain boundaries.

Metallography.—Although the arrangement of the atoms in the crystal of a metal or alloy and hence the system in which it crystallises can only be determined by the methods of X-ray crystal-

lography, the various phases which are present in an alloy and the arrangement of the crystals can be identified by ordinary microscopy. To do this one face of a small piece of the alloy is ground flat on a grindstone or file and then taken down almost to a polish on successively finer grades of emery paper, e.g. coarse, 1M, 1F, 0, OO, OOO. Finally a revolving wheel covered with velveten such as Selvyl cloth, to which has been applied an aqueous suspension of very finely divided alumina, magnesia, or chromic oxide, removes the last remaining scratches and leaves a mirror finish. Etching this

differences in the depth of etching, and the reflecting microscope which employs mirrors instead of lenses and has a much greater working distance than the ordinary microscope, thus enabling phase changes at high temp. to be followed without risk of damage to the instrument.

EXTRACTION METALLURGY is the science and art of extracting the metal from its ores and refining it. In general only the precious metals such as gold, platinum, etc., are found 'native,' that is in the elemental state. Baser metals, owing to their higher chemical reactivity, are more often found in combination with non-



PHOTOMICROGRAPHS

Left, grey cast iron showing graphite flakes and phosphide eutectic ($\times 250$); right, the iron carbide eutectic pearlite ($\times 750$)

surface with dilute acid or other reagent for a few seconds, washing first in water and then alcohol, and drying in a stream of air reveals the micro-structure. The etchant is always a reagent which attacks the constituents to varying degrees. For instance, one phase may appear dark, another light because it is untouched, and a third coloured. Grain boundaries appear as dark lines. Unlike the biological microscope which transmits light through the transparent specimen, the metallurgical microscope reflects light from the face of the opaque specimen. In recent years the electron microscope, using plastic replicas of the etched metal surface, has revealed much new information about the very finest micro-structures. Other recent developments are the phase contrast microscope which emphasises minute

metallic material such as oxides, sulphides, sulphates, carbonates, phosphates, silicates, etc. It is common to find the minerals of two or more metals deposited together, e.g. the nickeliferous magnetic pyrites of Canada, which consist of nickel, copper, and iron sulphides associated together. Other minerals may consist of the double compound of two metals, e.g. dolomite, a calcium-magnesium carbonate. The ore generally consists of the metal-bearing mineral associated with a more or less large proportion of earthy material or 'gangue.' It is only when the cost of extraction, considered in conjunction with marketing costs (e.g. transport over long distances when the metal is found in remote regions), is economic relative to the selling price (a factor governed by supply and demand) that the deposit is

reclaimed as an ore. It is commercially practicable to mine and treat material containing very small percentages of the precious metals, e.g. gold ores may contain as little as 0·2 oz. per ton, while on the other hand it does not pay in most countries to deal with iron deposits containing less than about 20 per cent of iron. Before the extraction processes can be carried out as much of the earthy material as possible must be removed from the ore, the process being known as ore dressing. Rock ores are first broken down in jaw-, gyratory-, or roll-crushers, or in stamp mills, then finely ground to a slime in ball mills. The next stage is classification sorting of the slime into metal-bearing and metal-free fractions. Most classifiers operate on the principle of Stokes's law, in which a rising column of water in a tank containing the slime carries away the less dense earthy material while leaving the denser metalliferous material in the tank. 'Concentration' follows: magnetic material can be separated from non-magnetic in the magnetic separator. Jigs and concentrating tables and the old gold-miner's pan all depend upon separation of the less dense 'tailings' and denser 'concentrates' into two layers, a process known as stratification, when the slime is treated with a stream of water. 'Froth flotation' is able to concentrate extremely fine material and is particularly applicable to sulphide ores. In this method frothing and collecting agents are added to the slime in a tank and air bubbled through it from the bottom. The mineral adheres to the bubbles and is carried to the surface, where it is scraped off into separate containers. After concentration the mineral must be filtered and dried ready for the extraction processes. The metal may be extracted by the application of high temps. (pyrometallurgy) or electric currents (electrometallurgy) or a combination of both. The former is the most widely used. The term pyro-metallurgy covers calcining, roasting, sintering, smelting, converting, and distilling. *Calcining* in kilns decomposes carbonates to oxides and drives off water from hydroxides. *Roasting* is generally intended to oxidise sulphides to oxides or sulphates, and is usually performed in a tall cylindrical furnace with a number of superimposed hearths fitted with mechanical rabbles which rake the charge as it falls from hearth to hearth down the furnace. *Sintering* causes finely ground material to cake, so that it can be charged into smelting furnaces without fear of clogging them with dust.

Smelting is the process in which the metallic compound is broken down to yield the metal. Two types of furnace are used: the reverberatory furnace and the blast furnace. In the reverberatory furnace the fuel (coal, coke, gas, or oil) is burned in a separate chamber from the hearth where the concentrate lies. The products of combustion pass into the hearth and heat the charge to above its melting-point. An excess of oxygen is provided which oxidises sulphides to oxides, then, as in the case of the copper-

iron 'matte' in copper smelting, an oxide-sulphide reaction takes place which yields copper and sulphur dioxide in this example, the iron reacting with the silica to form an iron-silicate slag which floats on the copper. In blast-furnace smelting the metalliferous material and fuel in the form of coke are mixed together in the same chamber and air blown in from tuyères at the bottom. The coke serves two purposes: to be a source of heat and to provide carbon which reduces the oxide to metal, e.g. the iron blast furnace. Limestone is added to form a slag with the silica still remaining from the original gangue. In the case of certain metals, notably zinc, the temp. of dissociation of the compound is so high that the metal appears as a vapour. When this is so the coke for reduction and the metalliferous material are heated together in a retort by an external flame. As the metal vapourises it distills over into a condenser where it is liquefied.

Electro-metallurgical extraction applies to the deposition of a metal from one of its salts by the passage of an electric current. In many cases an aqueous solution of the salt can be used, e.g. copper is deposited from copper sulphate solution, but for electro-chemical reasons other metals cannot be so treated; instead the salt is fused and the current passed through the molten bath, e.g. extraction of aluminium from bauxite. In electro-refining the principle is the same but the conditions are so adjusted that only the metal required is deposited, the contaminating metals being left in solution.

Hydro-metallurgy is closely connected with ore-dressing. It is often possible to dissolve out the metallic compounds from the ore and leave the gangue behind. Sulphide ores may be rendered soluble by roasting to oxides and then converting to sulphates by the addition of sulphuric acid. The sulphates are 'leached' out with water. In the case of copper, electrolysis is a logical continuation; in gold extraction the metal is precipitated by cyanide.

METALLURGICAL HEAT TREATMENT. In order to develop to the utmost the properties of an alloy it is almost always necessary to heat treat it. Except in the single instance of alloys made by the methods of powder M. all alloys start life as castings. Sometimes they are cast directly into the shape of the article required, but more often they are cast first into ingots which are rolled into bar or sheet for final forming. Whichever method is used the alloy first develops a structure which is typical of cast metals, e.g. large crystal size with the crystals often orientated in directions which give planes of weakness; non-uniform dispersal of constituents and unwanted phases present. In addition, cooling stresses will very likely be present. Therefore one of the most important heat treatments, *annealing*, is adopted, to remove this 'as cast' structure. As already discussed, most engineering alloys are made up of a ductile solid solution, together with one or more relatively brittle phases. Fortun-

ately when nearly all alloys are heated to above a certain temp., which varies from one alloy to another, the brittle phase is taken into solution in the first phase. As soon as solution is complete the first phase recrystallises into a mass of minute new crystals. As the temp. rises still further the new crystals begin to run together and form larger ones; for this reason the temp. must not be any higher or the time any longer than necessary. During the rapid cooling that always follows casting there is not sufficient time for the diffusion processes, which enable the metals to sort themselves out into the various phases, to take place. Consequently there is sometimes more, sometimes less, of a particular phase present than there would be under conditions of slower cooling. By bringing the alloy to a single phase, holding at temp. for a while to enable rediffusion to take place and cooling very slowly in the furnace, the required proportion of the phases is brought about. Annealing is frequently used for another purpose. Metals and alloys become hard when cold worked, e.g. rolled, beaten, or pressed, and if the cold-working is continued beyond a certain point tearing or cracking begins; an intermediate anneal between stages brings about recrystallisation and the metal is strengthened enough to permit further cold work.

Normalising is a term applied solely to steel. It is similar to annealing, except that the soaking time at temp. is shorter and cooling is in air. It confers a finer and therefore tougher structure to the steel.

The Effect of Quenching.—When an alloy which contains two phases at room temp. is heated to a single phase condition and then cooled again, the second phase which has been dissolved reprecipitates, and the form which it assumes as it does so depends upon the rate of cooling. With very slow cooling in the furnace it usually has time to form a network in the boundaries of the grains of the first phase. With quicker cooling, say in air, it may not be able to do this, but instead precipitates as separate particles within the grains. Very often with fairly rapid cooling it deposits as plates in the crystallographic planes of the first phase. The condition of uniformly dispersed particles gives the best mechanical properties. When cooling is extremely rapid the precipitation of the second phase may be inhibited altogether so that at room temp. only one phase is present instead of two. This is extremely useful because it enables the alloy to be fabricated to the required shape. A second, lower temp., treatment then brings about the precipitation of the dissolved phase and the alloy hardens. The particles of a phase reprecipitated in this way are often exceedingly fine, sometimes sub-microscopic, but if the temp. is raised too high they coalesce and the hardness of the alloy falls. This is the basis of the 'solution heat treatment and ageing' of aluminium alloys, and the hardening and tempering of steels. In the latter, however, quenching does not prevent reprecipitation of the second

phase and the condition of incipient precipitation makes the steel glass-hard. Tempering takes the precipitation a stage further and the resultant fall in hardness is accompanied by a development of toughness.

Case-hardening is the treatment accorded to low carbon steels whereby a high carbon 'case' up to about $\frac{1}{16}$ in. thick is formed at the surface. The low carbon core is tough but soft, and the object of the high carbon case is to provide resistance to wear, only a hard brittle material being able to do this. The case can be applied in two ways: (a) by pack-hardening. The article is packed in charcoal containing an activating agent such as barium carbonate and the whole heated to 900–950° C. for several hours, followed by a grain-refining treatment; (b) by cyanide hardening. The article is this time immersed for $\frac{1}{2}$ to $1\frac{1}{2}$ hrs. in molten sodium cyanide. The above two methods are alternatively called 'case-carburising' because the case is derived from absorbed carbon. Another kind of case is applied by 'nitriding.' The steel is heated to 450–500° C. in an atmosphere of ammonia gas. The steel combines with the nitrogen in the ammonia and forms iron nitride in the form of needles to the depth of 1 millimetre. Special steels have been developed for nitriding of which one, Nitralloy, covered by patent, is well known. These steels contain such alloying metals as chromium, vanadium, titanium, etc., with the object of reducing the brittleness of the nitrided case, and about 1 per cent of aluminium has been found to be beneficial. An initially higher carbon provides for less during treatment.

Flame Hardening and Induction Hardening are two methods of conferring a hard surface on steel purely by quench hardening the outer layers. A shallow depth of, say, $\frac{1}{16}$ in. of the steel is heated to hardening temp. by, in flame hardening, an oxy-acetylene flame, and in induction hardening an electrical high-frequency induction coil. Heating is extremely rapid, and immediately the correct temp. is reached the source of heat is removed and a water spray turned on so as to shock-cool the steel. Fully automatic machines have been developed for production hardening of standard components by both flame and induction hardening. Gear-teeth hardening particularly lends itself to this, e.g. Shortenising.

METALLURGICAL FURNACES serve two main purposes:

(1) *Melting*, which may be (a) purely remelting of ingot and scrap, etc. (b) remelting with some degree of refining, or (c) part of an extraction process. Examples of (a) are the electric induction melting of steel and the crucible melting of brasses, bronzes, aluminium, lead, tin, and zinc base alloys; of (b) the basic electric arc furnace for steel where impurities like sulphur and phosphorus are largely eliminated, the carbon and manganese adjusted to any required value and alloy additions made; and of (c) the blast furnace for producing pig-iron and the reverberatory smelting of copper. Remelting furnaces

find their widest application in the foundry and in plants where alloys are made up into 'notch bars' from their constituent pure metals to definite specifications. For non-ferrous alloys the crucible furnace is the most popular. Originally heated by coke fire, modern crucible furnaces are almost universally oil or gas fired. The crucible stands in a refractory-lined case closed by a lid. The oil or gas burner injects the flame tangentially into the bottom of the case, so that the flame spirals upward round the crucible and leaves at the top. The air supply to the burner is under compression from a blower. The furnace may be of the bale-out (metal baled out with a ladle), lift-out (crucible lifted out with tongs), or tilting type (furnace tilts on trunnions by means of either hand or power operation). For larger quantities of metal the Ajax-Wyatt low-frequency electric furnace or the rocking arc electric furnace may be used. In the former a V-shaped channel below and connected with the main chamber acts as the secondary coil of an electrical transformer. The low-frequency current induced in the channel heats the metal. The rocking arc furnace consists essentially of a spherical chamber with an electrode entering from each side on the horizontal axis, and meeting at the centre to form a spark-gap. The furnace is mounted on trunnions and is rocked mechanically about the horizontal axis through an angle of about 90° during melting so that once in each cycle part of the lining is first heated directly by the radiation from the arc and then passes under the charge to which it imparts its heat. Rapid heating of the charge is thus ensured. For steel remelting the coke-fired pit crucible furnace is still used for tool steels, but for large melts the high-frequency electrical induction furnace is a more modern development. In this the metal is placed in a crucible in a tilting case. A water-cooled coil round the crucible carries a high-frequency current which induces eddy currents in the steel, and melting results from the heat generated by the steel's resistance to these.

(2) *Heat-treatment furnaces* are either of the 'batch' type, which are loaded at the beginning of the treatment and unloaded again at the end, or of the 'continuous' type in which the work is continuously loaded at one door, and after moving slowly through the furnace are unloaded at another. The latter type may consist either of an annular hearth which rotates continually at predetermined speeds, the loading and unloading doors being side by side, so that the work completes one revolution during treatment; or it may be a straight-through furnace with a loading door at one end and an unloading door at the other. The work is carried through either on a moving hearth working on the continuous belt principle or on rollers, in which latter case a ram pushes it from behind. Heat-treatment furnaces in the majority of heat-treatment shops are either gas fired or electrically heated. Though special alloys, e.g. tool steels, require temps. above

1000° C., for the commoner industrial alloys furnaces capable of operating continuously at up to this temp. cover most needs. Gas-fired furnaces are mostly of the muffle type, and generally the flames from a row of burners down each side pass into the chamber, the burners being so designed that the flames follow the curve of the arch of the roof, and escape to a chimney. Particularly in large high-temp. furnaces much heat which would otherwise be lost up the chimney is saved by incorporating a recuperative system. For smaller furnaces such as laboratory muffles, or wherever direct contact between the charge and flame is undesirable, a special muffle lining heated by gas flames on the outside holds the charge. For temps. over 1000° C. a fan-type blower provides a forced draught for combustion. Electrically heated furnaces of the muffle type have the heating elements of special alloy such as nichrome (80/20 nickel/chrome) disposed inside the chamber along the walls and roof, and under the heat-resisting alloy hearth plate. To avoid a lower temp. at the door end due to heat loss through the door, the door also is often fitted with rows of elements. The freedom from the necessity of providing burner inlets and exit flues makes electric furnaces ideal for inert atmosphere work. Such furnaces, e.g. the bell type, are used for 'bright annealing' steel and copper alloy, etc., wire, sheet, and strip where the inert atmosphere preserves the original bright finish. Cracked ammonia is widely used for this purpose. For treatments when close limits are set to the temp. range it is vitally essential to ensure that all parts of the furnace are at the same temp. Up to a temp. of about 750° C. the vertical air-circulating furnace fulfills these requirements. It is a vertical cylindrical furnace closed with a cover at the top. The heating elements are on the inside of the insulating outer case, but outside the metal basket which carries the charge. The basket has sheet-metal sides, a grid bottom, and open top. A fan beneath the basket draws air over the elements, where it is heated and blows it up through the grid into the basket, from which it passes out at the top and is recirculated over the elements. Some alloys are heat treated in baths of molten salts heated by gas or electricity, e.g. the solution treatment of aluminium alloy sheet. Automatic temp. control can be provided on all furnaces by thermoelectric controllers operating motorised valves on gas furnaces and relay-operated contractors on electric furnaces.

ELECTRO-METALLURGY, broadly speaking, is the application of electricity to metallurgical processes; hence in its widest sense it is often applied to processes in which electricity is used merely as a source of heat to motivate purely chemical or physical reactions, e.g. the electric arc furnace for steel-making and electric welding. More correctly the term should be limited to electrolytic processes.

Electro-deposition embraces the electrolytic extraction of a metal from its salts, either molten, e.g. aluminium, or in

aqueous solution, as in electro-plating and its specialised application electro-forming. In order to understand the principles of electro-deposition, consider the case of silver. When silver nitrate is dissolved in water it ionises into the positively charged silver ion and the negatively charged nitrate ion. If two pieces of metal, to act as electrodes, say a spoon connected to the negative terminal of a battery and a piece of sheet silver connected to the positive terminal are immersed in the solution, the current will begin to flow in at the piece of silver, through the solution and out again at the spoon. The spoon, being the negative electrode is called the cathode, and the piece of silver, being positive, is the anode. As the current flows the silver ions are attracted to the cathode, pick up their missing electrons, and become silver metal which deposits on the spoon. The nitrate ions migrate to the anode, give up their excess electrons, and then react with the water to form nitric acid and release bubbles of oxygen from it. At the same time some of the silver from the sheet-silver electrode dissolves and keeps the silver-nitrate content of the solution constant. In electroplating the nature of the plate can be governed quite widely from mat to shiny and from strongly adherent to crumbly by control of the condition of the bath, e.g. composition, acidity, temp., presence of certain addition agents, current density, etc. Some metals which give a good bright, non-tarnishing finish to the basis metal of the article to be plated do not adhere very well to it, and also being porous may allow moisture to permeate through and set up corrosion which eventually causes the plate to strip off. A case in point is chromium plate on steel. To overcome this difficulty layers of one or more metals which supply the missing properties are deposited first, e.g. copper first on steel for adhesion, then a layer of nickel for corrosion protection, and finally chromium for its non-tarnishing lustre. Alloys may be deposited by electrolysing a solution of the mixed salts of the component metals, e.g. brass can be plated out from a mixed copper and zinc solution. The same principles apply to the electrolysis of molten salts. In the case of bauxite dissolved in cryolite, a very heavy current is required because of the high energy of association binding aluminium and oxygen together. Electro-forming is the reproduction of any surface, metallic or otherwise, by electrodeposition methods. An example is the copying of the 'master' gramophonic record in order to be able to mould thousands of replicas for sale. To do this the master of wax is coated with a very fine metallic powder to render it conducting. It is then made the cathode in a bath of copper sulphate, a plate of copper being the anode, and a current passed until the copper which plates out on the disk is thick enough. Next the wax is stripped off and the copper negative used to make, by similar plating processes, a hard steel negative in the form of a die. Two such dies, one with the obverse and the other the reverse

recording, are then placed in a press where the resinous material of which the final record is made is heated to the plastic state, pressed and cooled and becomes the positive replica of the original wax recording. In electrotyping the same principle is applied for the formation of a copper printing medium from a wax or plastic original (*see further under PRINTING*).

METALLIC CORROSION can take place as a result of two general forms of attack:

(a) Electro-chemical (electrolytic) and

(b) direct oxidation.

Electro-chemical Corrosion.—Though most metals tarnish due to reaction with gases in the atmosphere practically all the deterioration of structural alloys in common use is due to electrolytic attack, that is, small local electric cells are formed all over the surface of the metal. If two plates, one of copper and the other of zinc, are immersed in an electrolyte (a solution which will conduct an electric current), e.g. dilute sulphuric acid, and joined together by a wire, a current will flow from the copper to the zinc and the current will have a definite value. The zinc dissolves in the acid and hydrogen forms in bubbles on the copper. Now suppose we have a large panel of zinc, say as a roof sheeting, and this zinc has minute specks of copper embedded in the surface due to accidental pick-up during rolling. Now suppose that the roof is in an industrial atmosphere which contains large quantities of sulphurous gases from coal and coke fires; these gases combine with the water vapour in the atmosphere to form sulphuric acid which descends with fog and dew upon the zinc roof. The zinc, acid, and particle of copper now produce an electrolytic cell, and the zinc begins to dissolve until a small pit is visible on the surface. The pit in time grows larger and joins with neighbouring pits until in due course a hole has been eaten right through the sheet. In a similar manner, water containing softening salts which are electrolytic will cause holes to appear in aluminium pans. Not all electrolytes are acids; many neutral salts such as common salt and sal ammoniac are strong electrolytes. This explains why corrosion is such a problem on and near the sea, for the air is laden with salt-water drops carried by the wind from spray, etc. It is not always necessary for two different metals to be present to form a cell. Two different phases of one alloy may, in the presence of an electrolyte, have an appreciable potential difference, so that one phase dissolves and corrosion takes place on a microscopic scale. This explains why pure metals are more resistant to corrosion than their alloys, even in the presence of quite strong acids, for only one phase is present. It is possible to draw up a table, called an electro-chemical series, in which metal electrolyte combinations are ranged in order from the most electro-positive at the top to the most electro-negative at the bottom. Metals which lie at the extremes of the table form, if used together, a powerful cell with a high voltage, and corrosion takes place rapidly. Such a

combination should never be used in a structure unless it is either well coated with paint to keep the damp out or an insulating layer is placed between the two metals. Metals which are close together in the table, on the other hand, may be used together with safety.

Direct Oxidation.—Apart from light tarnishing, direct oxidation of metals to the extent of scaling only takes place at high temps.

Protection against Corrosion.—As moisture is essential to all forms of electrolytic corrosion, the best way of preventing attack is by keeping out the moisture by means of a coat of paint, oil, wax, or any other water-repellent material. Paints tend to be slightly porous, and often corrosion inhibitors, such as chromates, are incorporated in the primer to minimise the effect of such water as does manage to get through. Zinc coating (galvanising) on steel sheeting preserves the iron by 'sacrificial protection,' i.e. the zinc is anodic to iron and dissolves instead of the iron which would otherwise go into solution as a hydroxide of iron and appear as rust. Another method is to passivate the metal by causing it to develop an oxide or other film under controlled conditions. This film often also forms a good 'key' for a paint layer. Examples of this are the anodising of aluminium (aluminium oxide film), the Bower-Burfl process for iron (iron oxide film) and Coslettising, Parkerising, and Bonderising for steel (iron phosphate film). Some metals like chromium form a passive oxide film naturally and are therefore more corrosion resistant than others and do not require extra protective layers. It is the chrome oxide film which gives stainless steel its resistance to corrosion.

POWDER METALLURGY is the study of a method of preparation of solid metal articles from powder. One of the earliest applications was in the manuf. of tungsten filaments for electric bulbs. Tungsten was available in powder form, but owing to its high melting-point of 3360°C . could not be melted and cast into bar for wire-drawing in the usual way. The difficulty was overcome by subjecting the powder to very high pressure in a steel die so that a small bar was formed which, though very weak and brittle, could be handled without falling to pieces. The bar was next placed in a tube containing hydrogen to keep the air from reaching the tungsten and oxidising it, and an electric current passed through it so that it became heated to a high temp. as a result of its own electrical resistance. This sintered the grains of powder together and the bar became strong enough to be hammered into a rod, and eventually drawn into fine wire. The same method, with improvements, is still used to-day. The stages of pressing and sintering are an essential part of powder M. Pressing locks the particles of powder together more or less mechanically, though it is possible that some superficial welding takes place, and the 'compact,' as it is called, usually has very little strength,

its density is much lower than that of the finished article, and the microscope reveals the presence of numerous cavities. Heating to a temp. near to, but below the melting-point causes diffusion of the grains, so that the cavities disappear and the density rises. When an alloy compact is being made, as for instance bronze, the two constituent metals, copper and tin in powder form, are thoroughly mixed together, pressed, and sintered. On completion of sintering, the tin and copper are found to have diffused together so thoroughly that instead of individual grains of reddish copper and grey tin being visible, the microscope shows only yellowish-red grains of the *a*-bronze phase. This is one of the reasons why the initial powders must be in an extremely fine state of subdiv., for then it takes a much shorter time for the various metals to diffuse into a homogeneous alloy. Sometimes incipient melting of one metal so that it can cement the grains of other higher melting-point constituents together is permitted, e.g. cobalt mixed with tungsten carbide for high-speed tool tips. It is possible for a compact to be hot-pressed, i.e. pressing and sintering combined in one operation. Hot-pressing is, however, more expensive than cold-pressing because of the difficulties of heating massive steel dies and because the die life is shorter. Another interesting application of powder M. is the manuf. of self-lubricating bearings. Copper and tin powder, together with a little graphite, are pressed and sintered, but the compact is deliberately left porous so that oil can be forced into the pores. So much oil is left in the bearing that it will run a life-time without re-oiling. By suitably shaping the die the powders can be pressed into the final shape of the article required, in the same way that plastics can, and the surface finish and dimensional accuracy are very good. So far various considerations, such as the pressure required, have limited power compacts to a few pounds in weight, but it has found numerous applications where the older methods of fabrication could not easily have been used.

FABRICATION OF METALS.—This covers all the different ways in which the ingot metal from the smelters is rendered useful for engineering or decorative purposes. The actual manipulation of the metal is largely the business of the engineer or foundryman, but he has to work in close co-operation with the metallurgist, who will keep him informed of such matters as the effect the processes are having on the internal structure of the metal, e.g. grain size, growth, and orientation; internal tears due to overstressing, heat treatments before and after manipulation, etc. The fabrication methods are briefly:

Rolling.—This can serve two purposes: (1) to break down the coarse cast structure of the original ingot or slab, and (2) to give the required final shape and finish, e.g. square, round, or hexagonal bar, rod for wire-drawing, or sheet of various gauges with or without a mirror finish.

The final stages, where the reduction per pass is small, are often performed in the cold so that the metal is work-hardened in order to obtain greater strength (hard-rolled).

Forging embraces hammer-forging, drop-forging, and press-forging. In hammer-forging a steam or pneumatically operated hammer reciprocates and beats the metal between itself and the anvil. It is useful for forging comparatively simple shapes and for breaking down the cast structure of ingots for further processing. In drop-forging the metal, initially in the form of a piece of rod or bar, is forced, under a blow, to fill the cavity in a mould or die and thereby reproduce its shape. The die is split into two and the top half is attached to a heavy 'tup,' the bottom half being attached to the base of the machine. The tup is raised mechanically to some 10 ft. above the base, and then allowed to fall under gravity so that it drops on to the bottom half-die, and the blow forces the bar into the cavity. A shallow trough round the die cavity receives excess metal or 'flash,' which is later trimmed off. Where the shape is complicated several sets of pre-forming dies may be necessary to fashion the bar roughly to shape before the final operation. Press-forging employs a squeeze rather than a blow. Drop-stamping is very similar to drop-forging, but applies more particularly to the shaping of sheet metal into hollow-ware.

Extrusion is a process by which a cast billet is forced, by hydraulic pressure, through a hole in a die at the end of a cylindrical container in a comparable manner to tooth-paste being squeezed out of a tube. The hole in the die may be simple in shape, such as round or hexagonal, or it may be quite complicated, such as in the shape of the Greek letter psi (ψ), which would be impossible by rolling. Brass and aluminium alloys are two commonly extruded metals.

Spinning is a process of forming hollow-ware of circular cross-section. A flat disk of the metal is revolved at high speed, and by means of special tools is gradually spread over a wooden mandrel of the required shape. It is particularly applied to soft metals like pewter, aluminium, and silver.

Wire-drawing consists of reducing rod to wire by drawing it on a special draw-bench through die-holes of tungsten carbide or diamond, using suitable lubricants.

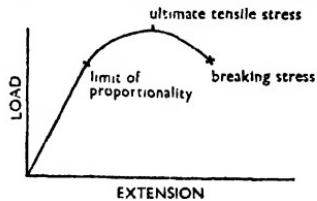
Casting performed in the foundry consists of pouring molten metal into a mould. The mould is most commonly silica sand, bonded together with a small amount of clay material, water, and sometimes a cereal binder such as dextrine. Metals with fairly low melting-points may, however, be die-cast, that is, cast into a metal die. In gravity die-casting the metal is caused to fill the mould by the force of gravity, as in sand casting; in pressure die-casting hydraulic pressure is employed to force the metal into the die. In centrifugal casting, centrifugal force helps the metal to fill all intricacies of the mould.

METAL TESTING.—Tests of metals and

alloys fall into two categories: (1) destructive and (2) non-destructive. In general the destructive tests give information on the mechanical properties of the material, whereas the non-destructive tests only indicate whether the material, or more often a fabricated article, is free from defects.

Destructive Tests.—Most destructive tests involve the use of a test-piece, either specially formed as an appendage to the article being produced, e.g. to a casting or forging, or taken from a representative sample of the raw material, or machined out of the article itself. Whichever is the source of the test-piece, the latter is always stressed until it breaks. The two standard tests most used in engineering are the tensile and the impact test. To these may be added the hardness test which is not, strictly speaking, destructive, though a small mark remains.

The tensile test-piece is essentially a rod of circular cross-section (except when a flat strip is used as for sheet material) which is gripped at both ends and pulled



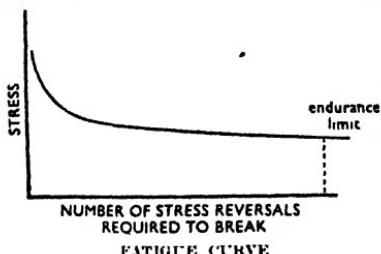
A NORMAL TENSILE TEST CURVE

apart by a machine which is capable of measuring the load applied. The centre portion is marked off by two small 'pop holes,' an accurately measured distance apart, and this distance is the gauge-length. On each side of the gauge-length the rod increases in diameter to ensure that the fracture takes place in the gauge-length. The test-piece may be of any size, but for comparable results between different sizes it has been found that the gauge-length must be four times the square root of the cross-sectional area. In the most popular size of test-bar the gauge-length is 2 in. and its diameter 0.543 in., so that the cross-sectional area is $\frac{1}{4}$ sq. in. If the load on the test-piece is increased in small increments of, say, half a ton and the corresponding stretch or extension measured and a load-extension graph plotted, it is found that there is first a straight line up to the 'limit of proportionality,' then a curved portion which reaches a peak at the ultimate tensile stress (U.T.S.), after which there is a fall to the point at which fracture takes place, the breaking stress. After the bar has been broken the two halves are fitted together and the distance apart of the pop-holes measured; from this the elongation per cent can be calculated. Also it will be found that (if the metal is ductile) the fracture will have occurred in the middle of a well-marked waist which has appeared;

measurement of the diameter at this point enables the reduction of area per cent to be calculated. While the ultimate tensile stress indicates the highest stress which the metal will stand, the elongation and reduction of area are measures of the ductility.

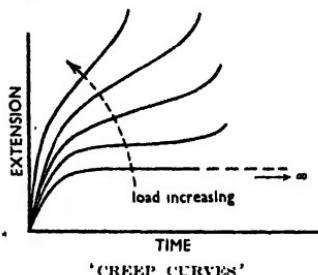
The impact test is a means of determining the ability of the metal to resist a sudden shock. The principle of the test is that a standard size of notch is machined in a round or square section bar to concentrate the stress. The bar is gripped vertically in a vice which holds it against the blow of a weight at the end of a pendulum. The energy in foot-pounds absorbed in breaking the bar is proportional to the distance which the bar swings after impact, and is quoted as the impact value. The Izod and Charpy tests are the best known impact tests. There are several methods for determining the hardness of a metal, but the indentation test is the most universally accepted test in M. and engineering. Examples are the Brinell, Vickers, and Rockwell tests. In the Brinell test a heavy load forces a hard steel ball (3000 kg. load and 10 mm. diameter ball for steel testing) into the metal, and the diameter of the impression left is measured and translated into hardness units. The standard Vickers test employs a pyramidal diamond, and the length of the diagonal of the diamond impression is converted into hardness units. The Rockwell test may use either a ball or diamond, but in each case the depth of penetration, after applying an initial light load, is measured.

The fatigue test: many mechanical components built from metal with a high tensile strength are found to have



fractured in service when it is quite certain that the ultimate tensile strength has not been reached. It is nearly always found that stresses have been of a reciprocating nature, as in the case of an axle-shaft revolving under a bending stress, or a piston connecting rod which is alternately stretched and compressed once every stroke. Such failures under alternating stresses show a characteristic shiny fracture, and are known as fatigue failures. Common tests which give an evaluation of performance under fatigue conditions are the Wöhler, Haig, and Schenck tests. The Wöhler test consists of a revolving bar of circular cross-section, gripped at one end

by the revolving mechanism and having a weight hanging from a ball-race at the other, there being no further support between the two. The speed is 2850 r.p.m. In the Haig and Schenck tests the bar is compressed and tensioned alternately thousands of times per minute, plus and minus any desired load. Whichever test is used a graph can be plotted of load against the number of reversals of stress required to cause fracture. At low loads no fracture will occur after an infinite number of reversals, but as the load is increased the specimens begin to fail after decreasing numbers of reversals. The endurance limit is the lowest load which will cause the test-piece to break within a stated number of stress reversals, e.g. 10,000,000.



The creep test is applied to alloys which spend most of their service life under stress at high temp., e.g. turbine blades. Such components slowly 'creep,' i.e. extend over a period of hundreds of hours and then finally break under loads far lower than the normal short-time strength at that temp. There are three stages of creep: the first is an initial extension as the load is first applied; this merges into the second stage, where the rate of extension is much less than in stage 1, and may even be zero; then in the final stage the extension begins to proceed at an ever-increasing rate until it is terminated by fracture. Under low loads the third stage may never be reached even after thousands of hours, but with heavier loads the third stage appears, and as the loads are increased both the second and third stages become steeper, and fracture follows after a comparatively few hours. The results of the test can be applied in two ways: either the highest load is determined which, at the required temp., will not cause fracture within a measurable period of time, or, if the conditions are particularly arduous, as in the case of a gas-turbine blade, it is first decided how long the component shall be required to last and then determine the highest load which will give this life without rupture.

Non-destructive Tests.—It is wasteful to saw up a casting, for instance, to look for shrinkage cavities or a welded component to investigate the soundness of the weld or a forging for internal tears. By the use of X-rays much of this is eliminated.

To take an X-ray photograph, a special X-ray film in a light-tight *cassette* is placed at one side of the article to be radiographed, and a beam of X-rays directed at it from the other. The 'hardness' or penetrating power of the rays is controlled by the voltage across the generating tube, and this and the time of exposure are adjusted according to the thickness and density of the material being investigated. After development the film shows dense parts of the article in a light tone, while porosity, holes, etc., show up as dark areas. Internal flaws, etc., in bar stock or forgings can be revealed by the supersonic crack detector, by which a note of supersonic frequency is transmitted into the metal from a 'prod' containing a vibrating crystal. The 'echo' from a flaw is picked up by a receiving prod and its presence shown on an oscillograph screen. External cracks on magnetic material such as carbon steels can be revealed by the magnetic crack detector. The metal is first magnetised by passing a current through it or by placing a coil round it, and then a suspension of fine iron powder in paraffin is poured over it. The two edges of a crack behave as opposite magnetic poles, and the accumulation of iron powder between them shows up the otherwise invisible crack. Non-magnetic materials may be tested for cracks by fluorescence. A solution of a fluorescent substance such as anthracene in a volatile solvent is poured over the article being tested. The solution penetrates the cracks, so that when excess solution has been wiped away and the solvent evaporated, a deposit of anthracene is left in the cracks. This deposit fluoresces under ultra-violet light from a lamp, and is visible in a darkened room.

See W. Hume-Rothery, *The Metallic State*, 1931; R. Greaves and H. Wrighton, *Practical Microscopical Metallography*, 1933; D. M. Liddell and G. E. Doan, *The Principles of Metallurgy*, 1933; W. D. Jones, *Powder Metallurgy*, 1937; C. H. Desch, *Metallography*, 1937; E. C. Rollason, *Metallurgy for Engineers*, 1939; A. G. Ward, *The Nature of Crystals*, 1939; F. Seitz, *The Physics of Metals*, 1943; W. O. Alexander and A. C. Street, *Metals in the Service of Man*, 1944; G. V. Raynor, *Introduction to the Electron Theory of Metals*, 1947; U. Evans, *Metallic Corrosion, Passivity, and Protection*, 1948; Machinery Publishing Company, *Powder Metallurgy in Practice*, 1948; and J. E. Garside, *Process and Physical Metallurgy*, 1949.

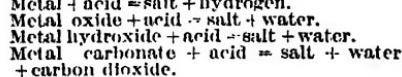
Metals. By reason of certain properties which are common to a large number of the elements and more or less absent in others, the elements are divided into two classes—*metals* and *non-metals*. Gold, silver, copper, lead, tin, etc., are M.; sulphur, bromine, hydrogen, phosphorus, etc., non-M. From earliest days M. have been distinguished from all other substances by their peculiar properties and applied to useful purposes. In the earliest list, we have records of the use of the seven M., gold, silver, lead, copper, iron, tin, and mercury. The M. are usually

opaque, their smooth surfaces reflect light to a high degree, giving them the property known as metallic lustre; they are good conductors of heat and electricity. All M., except mercury, are solid at ordinary temps., and all of them will crystallise under suitable conditions. They are usually characterised by having high specific gravities relative to the non-M., but there are exceptions to this, notably lithium (0.534), sodium (0.98), potassium (0.86), beryllium (1.85), and calcium (1.54). The melting points of the M. range from 26° C. (cerium) to as much as 3270° C. (tungsten), excluding mercury which freezes at -38.9 C. Some M., like antimony, are quite brittle, while others, like iron, possess great tenacity, whilst malleability is very common. The non-M., on the other hand, may be either gases, liquids, or solids, possessing little tenacity. They do not give the peculiar metallic lustre (graphite does, however, show a very definite lustre) and are bad heat and electricity conductors. Their sp. gr. is low, and hardness usually poor, whilst the solids are often very brittle. The two classes of M. and non-M. merge into one another, and certain elements are placed sometimes in one class and sometimes in the other, according as the distinction is based on physical or chemical properties. Arsenic, for example, possesses many of the physical properties of a metal, but in its chemical reactions it is more nearly allied to the non-M. Such elements as these are sometimes known as metalloids.

The chief chemical properties of M. include their strong affinity for certain non-metallic elements, e.g. sulphur, chlorine, and oxygen, with which they form sulphides, chlorides, and oxides. The metallic oxides are solid white or coloured bodies with an earthy appearance. Sometimes these oxides dissolve in water to give alkaline hydroxides (e.g. sodium, potassium, calcium). In any case there is always at least one oxide of a given metal which will function as a basic oxide by dissolving in acids to form salts, together with water. This capacity for the production of basic oxides is a very distinctive one. At the same time it must be remembered that a few metallic hydroxides (such as those of aluminium and zinc) can behave as 'amphoteric electrolytes' by exhibiting both basic and acidic properties, under favourable conditions. M. will, when fused, enter into the forming of *alloys* (q.v.). Because of their strong affinity for other elements M. are generally found combined with other elements, and consequently they have to be extracted from their ores by processes described under METALLURGY. The halogen compounds of the metal are stable as a general rule, and even in the cases where this is not so the decomposition of the halides by water is only of a partial nature. Thus sodium chloride is perfectly stable in contact with water, bismuth chloride is partially decomposed or hydrolysed by cold water, whilst the chloride of a non-metal like phosphorus is completely decomposed under like conditions. Again the M. have the power of entering into the

Metal	Symbol	Atomic Number	Atomic Weight	Melting Point. °C.	Specific Gravity	Specific Heat
Lithium .	Li	3	6.94	186	0.534	0.91
Beryllium .	Be	4	9.02	1300	1.85	0.38
Sodium .	Na	11	22.997	97.5	0.98	0.28
Magnesium .	Mg	12	24.32	650	1.4	0.25
Aluminum .	Al	13	26.97	658	2.7	0.218
Potassium .	K	19	39.096	62.5	0.86	0.166
Calcium .	Ca	20	40.07	810	1.54	0.15
Scandium .	Sc	21	45.10	1200	2.5	
Titanium .	Ti	22	48.10	1795	4.5	0.113
Vanadium .	V	23	50.96	1720	6	0.12
Chromium .	Cr	24	52.01	1550	6.0	0.12
Manganese .	Mn	25	54.93	1260	7.2	0.107
Iron .	Fe	26	55.84	1535	7.86	0.11
Cobalt .	Co	27	58.94	1480	8	0.106
Nickel .	Ni	28	58.69	1452	8.8	0.103
Copper .	Cu	29	63.57	1083	8.95	0.092
Zinc .	Zn	30	65.38	419.4	6.92	0.096
Gallium .	Ga	31	69.72	30	5.9	0.079
Germanium .	Ge	32	72.60	958	5.4	0.074
Arsenic .	As	33	74.96	Sublimes	5.73	0.08
Rubidium .	Rb	37	85.44		1.52	0.019
Strontium .	Sr	38	87.63	800	2.63	0.074
Yttrium .	Y	39	88.9	1490	5.5	
Zirconium .	Zr	40	91.0	1530	6.4	0.07
Columbium or (Nb))	Nb	41	93.1	1700	12.7	0.071
Niobium .	Mo	42	96.0	2450	10.2	0.065
Molybdenum .	Mo	43	96.0	2300		
Masurium ?	Ma	44				
Ruthenium .	Ru	44	101.7	1900	12.1	0.061
Rhodium .	Rh	45	102.91	1910	12.1	0.058
Palladium .	Pd	46	106.7	1550	12	0.058
Silver .	Ag	47	107.88	960	10.5	0.055
Cadmium .	Cd	48	112.41	320.9	8.65	0.057
Indium .	In	49	114.8	155	7.3	0.057
Tin (Tetragonal)	Sn	50	118.7	231.9	7.31	0.056
Antimony .	Sb	51	121.77	630	6.68	0.051
Cesium .	Cs	55	132.81	26	1.9	0.018
Barium .	Ba	56	137.37	850	3.7	0.068
Lanthanum .	La	57	138.90	810	6.16	0.045
Cerium .	Co	58	140.25	630	6.9	0.05
Praseodymium .	Pr	59	140.92	940	6.48	0.045
Neodymium .	Nd	60	144.27	840	6.96	
Samarium .	Sm	62	150.43	1300	7.8	
Europium .	Eu	63	152.0			
Gadolinium .	Gd	64	157.26			
Terbium .	Tb	65	159.2			
Dysprosium .	Dy	66	162.52			
Holmium .	Ho	67	163.4			
Erbium .	Er	68	167.7			
Thulium .	Tm	69	169.4	300	11.9	0.033
Ytterbium .	Yb	70	173.6			
Lutetium .	Lu	71	175.0			
Hafnium .	Hf	72	180.5	1700		
Tantalum .	Ta	73	181.5			
Tungsten .	W	74	184.0	3370	18.7	0.0358
Rhenium .	Re	75				
Osmium .	Os	76	190.8	2600	24	0.0312
Iridium .	Ir	77	193.1	2290	22.4	0.032
Platinum .	Pt	78	195.23	1755	21.5	0.032
Gold .	Au	79	197.2	1060	19.3	0.031
Mercury .	Hg	80	200.61	-38.9	13.595	0.033
Thallium .	Tl	81	204.39	304	11.85	0.033
Lead .	Pb	82	207.20	325	11.35	0.031
Bismuth .	Bi	83	209.00	271	9.78	0.030
Radium .	Ra	88	225.95	700	7.5	
Thorium .	Th	90	232.15	1450	11.1	0.028
Uranium .	U	92	238.17	1850	18.7	0.028

formation of complex salts, e.g. iron in potassium ferrocyanido $K_4Fe(CN)_6$. The non-M. do not do this. The tendency of M. to combine with hydrogen is very small. They either do not form hydrides at all, or if they do the resulting compounds are of a very loose nature (see SODIUM and CALCIUM). This raises the question as to whether the element hydrogen is to be regarded as a metal or as a non-metal. The facts are conflicting. In appearance hydrogen is a gas, and physically a typical non-metal. It shows (unlike non-M. such as sulphur) little tendency to combine with M., but, on the other hand, the compounds formed are more like salt in appearance than a typical alloy of one metal with another. But hydrogen shares with the M. that all-important electro-positive character to an exceptionally high degree. It gives rise to the hydrogen ion (q.r.), which, like the metallic ions, carries a positive charge. No non-metal can do this. In the processes of electro-chemical deposition (see ELECTROLYSIS) M. act like hydrogen, and are always set free at the cathode. Many of the M. can decompose water or steam with the production of hydrogen, whilst many more are capable of dissolving in acids to form salts, often with the production of hydrogen. The following schemes are essentially connected with M.:



Classification.—Sev. schemes of classification of the M. have been suggested from time to time. One old method depended on the relative ease of decomposition of water and of acids by them. A modern scheme is based on measurements of the potential difference between a metal and a normal solution of one of its salts under standard conditions, taking the zero value as that of a platinum electrode saturated with hydrogen at 1 atmospheric pressure in contact with a solution normal in respect to hydrogen. Some of the results are $L_i = -3.02$; $K = -2.92$; $Na = -2.72$; $Mg = -1.56$; $Al = -1.34$; $Zn = -7.6$; $Fe = -4.3$; $Ni = -2.2$; $Sn = -1.4$; $Pb = -1.3$ ($II\ O$); $Sb = +1.1$; $Bi = +2.2$; $Cu = +3.4$; $Hg = +7.9$; $Ag = +8.0$; $Au = +1.5$. In this electromotive series, one metal will replace another lower down in the series thus:



The further they are away in the series the better the chance of the change taking place. The M. may also be classified into (1) LIGHT METALS: (a) alkali metals, e.g. potassium; (b) alkaline earth metals, e.g. calcium; (c) earthy metals, e.g. aluminium; and (2) HEAVY METALS: (a) metals whose oxides form strong bases, e.g. iron; (b) those whose oxides form weak bases or acids, e.g. arsenic; and (c) noble metals, e.g. gold. Another method of classification adopted more generally is to take them in their order as suggested by the periodic system (see CHEMISTRY). Thus:

I. (a) Lithium, sodium, potassium, rubidium, caesium; (b) copper, silver, gold.

II. (a) Calcium, strontium, barium, radium; (b) beryllium, magnesium, zinc, cadmium, mercury.

III. (a) Scandium, yttrium; (b) Aluminium, gallium, indium, thallium; (c) the rare earth metals.

IV. (a) Titanium, zirconium, thorium; (b) germanium, tin, lead.

V. (a) Vanadium, niobium, tantalum; (b) arsenic, antimony, bismuth.

VI. (a) Chromium, molybdenum, tungsten, uranium.

VII. Manganese.

VIII. Iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum. See list of works cited under CHEMISTRY. See also ALLOY; ATOMIC THEORY; ELEMENTS. See Iliffe, Metals and Alloys, 1949.

Metal Testing, see under METALLURGY.

Metalwork, art of shaping and joining metal either for decorative or utilitarian purposes, or for a combination of these. The many uses to which metals (q.r.) may be put are the result of their properties; they are malleable, ductile, fusible (see CASTING), and capable of being joined together by the application of heat (see WELDING; SOLDERING). In the purely decorative uses of metal the precious metals take first place. They were probably the first metals known to man and have from the earliest times been used in the making of jewellery and articles of personal adornment (see GOLDSMITHS; SILVERSMITHS).

The working of metal precedes the Bronze Age (q.r.). Considerable skill was attained in early civilisations in working gold and copper before the discovery of bronze. Copper was known to the Mediterranean civilisation as early as 3500 B.C. and bronze about 2000 B.C. In the second millennium also tin was being worked in Britain. Iron was known in China and India much earlier, and artistic work in iron was being carried out in Egypt before the first millennium. With the coming of bronze, solid casting and then hollow casting were developed. Casting, hammering, and riveting are the basic methods in M. Other techniques which developed later are inlaying, damascening, niello work, engraving, embossing, repoussé, and filigree (q.r.). Enamelling (q.r.) is another form of decorative M.

Examples of skilled M. survive from all early civilisations, including the Minoan, Sumerian, Egyptian, Indian, and Chinese, and reveal that all methods of treating metal were known and practised. The precious metals, bronze, and copper were preferred for decorative and artistic work until late Roman times, iron finding its uses chiefly in the making of weapons and utensils. In the Middle Ages, however, wrought iron was put to decorative uses. Early Gothic work from the eleventh to the fourteenth centuries is notable for its elaborate scrolls and flower designs, decorative hinges, locks, and grilles. The dignitaries of the Church and the nobles turned their wealth into plate, thus giving ample opportunity to the smith. Later Gothic work was heavier.

more geometrical, and regular in design. Iron was treated cold, and the metal-worker borrowed his style from the stonemason. The file, the saw, and the drill took the place of the forge for artistic work. Pierced work became the fashion; that is, the riveting of decorative pieces to sheet metal, thus building up the decoration against a solid background. An excellent example is the screen made by John Tresilian, fifteenth-century work in St. George's Chapel, Windsor. Examples of oriental M. came to be known in Europe as a result of the Crusades and the commerce conducted by Venice. It. smiths were encouraged to perfect the art of engraving, gold and silver inlay, and damascening. In Italy in the Renaissance the quatrefoil design prevailed in open-work wrought-iron grilles. During the early Renaissance M. was as a result of classical influences excluded from architecture as much as possible in the work of Palladio and others. By the end of the sixteenth century, however, particularly in Venice, M. had come into use for railings, screens, balconies, staircases, lamp holders, etc. Mention must also be made of the Renaissance M. in Germany and Spain, principally in the service of the Church. The method of chiselling the required article from the solid iron came to be known as peculiarly Fr. from the excellent work done in the fifteenth century, but it later gave way to the It. style of working with thin strips of metal. In the baroque period of the later Renaissance, however, the Fr. smiths gave free play to elaborate designs in wrought iron, and during the seventeenth century the Fr. influence was predominant in Europe. The great châteaux of France show examples of wrought-iron gates, balustrades, and staircases which are unsurpassed. One of the greatest of the Fr. smiths, Jean Tijou, came to England at the invitation of William III., and examples of his work are to be seen in Hampton Court Palace and St. Paul's Cathedral. The eighteenth century was the great period of Eng. wrought-iron work, which only declined when cast-iron work came into general use. This was the result of using coal in smelting, first tried in England by Dud Dudley (q.v.). Wren used cast iron for the railings round St. Paul's Cathedral. The use of M. in the service of architecture must not obscure its other uses as a means of artistic impression in the hands of the locksmith, the pewterer and copper-smith (for domestic utensils), and the brassfounder (for church candlesticks, lecterns, and memorial brasses). Decorative work in lead is not common because of the nature of the material and is to be seen mainly on cisterns and water-pipe heads.

In recent times in Europe and the U.S.A. there has been an increasing use of M. in furniture and a revival of wrought iron in interior decoration. Greater opportunities have been allowed for original design, bringing new life to an art which suffered through the nineteenth century from the standardised production of decoration in cast iron and brass. See

also BRONZE AGE; IRON AGE; IRON WORK. See C. J. ffoulkes, *Decorative Ironwork from the Eleventh to the Eighteenth Centuries*, 1913; G. K. Gearlings, *Wrought Iron in Architecture*, 1929; H. M. Adam and J. H. Evans, *Metalwork*, 1939; and D. Smith, *Metalwork*, 1948; also the handbooks issued by the Victoria and Albert Museum.

Metamorphism. The term is sometimes restricted to changes due to the action of temp. and pressure upon rocks. It is more usually applied to any change in a rock after it has once been formed. Both aqueous and igneous rocks after their original formation undergo more or less alteration constitutionally, texturally, or structurally by the action of water, heat, and pressure. Rocks slightly modified, and which retain most of their original features, are called 'altered rocks,' while those whose original characteristics have been wholly disguised or obliterated are designated 'metamorphic rocks.' The M. of sedimentary rocks by water is illustrated by the formation of glassy quartzite from loose sandstones by the deposition of silica deposited in the interstices from percolating waters. The effect of heat in modifying the physical characteristics of stratified deposits is to be observed around the margins of intruded dykes, sills, and bosses. Thus clays and shales are baked to porcellanite and lydian-stones, sandstones are changed to quartzites, and limestones are marmorised. Around granite bosses an 'aureole' of 'contact M.' can be seen. In the surrounding rocks new minerals are developed, such as chlorite, mica, and garnet, and the M. decreases in intensity, zone by zone, as we pass outwards from the margin of the boss. The aureoles of the granite bosses of Galloway are 2 m. in breadth, and show a gradation from unaltered greywackes through schists to fine-grained gneisses.

Where wide regions have been subjected to pressure and crushing by crust-creep (dynamic-M.), we have areas of 'regional' M. The original structural features are often obliterated and new structures developed: e.g. argillaceous rocks are contorted and cleaved into slates and schists. The action of crust-creep on strata of alternately soft and hard bands gives rise to crush-breccias and crush-conglomerates. The pre-Cambrian fundamental gneisses and schists were held to be original deposits from a primeval ocean. It is now, however, generally admitted that the schistose structures of these foliated rocks are not of necessity primary, but may be secondary structures due to deformation. The majority of the foliated rocks in areas of regional M. appear to be of pre-Cambrian age, but many have received their foliated structures in post-Archaean times. See W. H. Hobbs, *Earth Features and their Meaning*, 1921, and J. Joly, *Surface-history of the Earth*, 1925, 1930.

Metamorphosis (Gk. *μεταμόρφωσις*, transformation) is the change in form which many animals undergo during their life hist. The larval existence is usually

passed in an environment in which the animal can accumulate food supplies sufficient to enable differentiation to be completed during a resting stage. This may be passed in complete quiescence, as in the pupation of insects, or the 'rest' may be of much more partial nature, as in the transformation of tadpole to frog. Some animals achieve their final adult form by a series of gradual changes, shown progressively at every moult, and are said to undergo incomplete M. Marked M. occurs in many aquatic animals, in Amphibia, Insecta, and in many animal parasites. The larva of some Crustaceans changes its form several times before reaching the adult stage. Work on Amphibian larvae has shown that their M. may be prevented by extirpation of the thyroid or of the pituitary gland. The M. of normal tadpoles may be accelerated by injecting appropriate extracts of either of these glands. The M. of Amphibia depends on the products of the endocrine system, and certain strains of axolotls, apparently never metamorphose unless they are given thyroid preparations. By preventing frog or toad tadpoles from rising to the surface of the water, their M. may be retarded for a year or more; if the larvae then be allowed to come to the surface, they metamorphose in the usual way. Amongst insects, the M. of the caterpillar into pupa and butterfly, and of the house-fly from maggot to pupa and adult fly, are well-known examples. Some threadworms have a free-living larval form which assumes the adult form in a plant or animal host. Other threadworms, freshwater mussels, and ichneumon flies are among the animalis parasitic as larvae, and free-living as adults. Parasites having a larval form in one host and becoming adult in a second or even a third host are not infrequent. Certain larval hookworms and tapeworms parasitise invertebrates and the adults live in vertebrates. See INSECTS AND PARASITISM.

Metaphor (Gr. μεταφορή, from μεταφέρειν, to carry over), figure of speech by which an attribute or name is given to an object which is not literally applicable to it, e.g. in Lamb's *Essays of Elia* the phrase, 'A healthy book,' occurs, or again a ship is frequently spoken of as 'ploughing the waves.' Thus a M. is a comparison implied but not formally expressed, and in this it differs from the simile, which is a formal and explicit comparison.

Metaphysical Poets. The title M. P. was given by Dryden to that school of poetry of which Donne was the founder and most illustrious example, and Cowley the best known follower. The fault of this school is the attempt to use lyric poetry as a vehicle for the expression of all manner of subjective or reflective ideas, and hence to subordinate to subtlety of thought and reasoning that appeal to the primary emotions which is the very *raison d'être* of lyric poetry. The use of philosophical conclusions, as exemplified by Francis Thompson's magnificent apostrophes to the sun, is perfectly legitimate; but the M. P. proved the futility of using the processes too.

Metaphysic(s), name originally applied to those books of Aristotle which followed his *Physics*, and which his editors called 'the book after the physics' (*μετά τὰ φυσικά*). As a philosophical term it is first used by Boethius (480-525). The medieval scholastics held Ms. to be the science of Being as such, and divided it into general Ms. or ontology, dealing with the immaterial concepts of essence, existence, causality, etc., and special Ms. comprising psychology and natural theology. The great debates of the Thomist and Scotist schools on the real distinction of essence and existence, as well as the disputes between the Arabian and Christian Aristotelian philosophers, were all fought out on the battlefield of Ms.

In modern times the word has been variously applied, but is usually defined as the science which treats of the most fundamental problems of knowledge and reality. Knowledge is discussed in a separate art, and Ms. is dealt with here only as touching upon the nature of reality transcending experience. The very possibility of a science beyond experience has been denied by numerous philosophers, and many works called metaphysical should rather be termed inquiries into the possibility of Ms. Thus Kant's celebrated work, *Die Kritik der reinen Vernunft*, is a mere inquiry into the possibility of a theoretical science of things beyond experience, and concludes with a denial of such possibility. Hence some modern philosophers have considered Kant as no metaphysician, but as a critic of the mental faculties, whose labours were to be the precursors of a new system of speculation. Positivism likewise appears to deny the possibility of Ms., and certainly rejects its use.

Metaphysicians are concerned with six main problems in discussing the nature of reality: (1) The existence of anything permanent lying as it were behind and forming the basis of the constantly changing phenomena of experience. The early Ionian philosophers, the Eleatics, Plato, Aristotle, and Spinoza all affirm such permanent reality against such opponents as Heraclitus, Bergson, and W. James. (2) The unity or otherwise of reality. The attempt to answer this question has given rise to monism (q.v.) and pluralism (q.v.). The former has found its prin. adherents in Thales, Anaxagoras, the Eleatics, Plato, and Spinoza, whilst pluralism is represented by such names as Democritus, Descartes, and Leibniz. (3) Assuming that reality is not one but many, is it of one kind? Leibniz maintains that the monads which constitute the total of reality are of one spiritual kind, but differ in degree. Descartes, on the other hand, argues a plurality of substances, both material and mental, and God from whom both are distinct. (4) The number of fundamental attributes belonging to reality. The defenders of monism, such as Leibniz, the materialists, voluntarists (e.g. Schopenhauer, Nietzsche), and neutral monists (e.g. W. James, Bertrand Russell), all hold one such attribute. A multiplicity of irreducible attributes is defended

by Spinoza and Descartes, and seems to be implicit in von Hartmann's 'philosophy of the unconscious.' (5) The relation between the various units or modes of reality. The mechanists and determinists affirm that each is absolutely determined by the others. The opposite view, allowing at least some measure of freedom of self-determination, is taught by creative evolution (Bergson), emergence (Lloyd Morgan, S. Alexander), teleology, libertarianism, necessitarianism, and the extreme school of tychism. (6) Finally the existence of anything which can be called divine. Generally the atheists and materialists deny such a reality. Their opponents may be classed as theists, deists, and pantheists. Theists include all the historical churches; deists many freethinkers of the seventeenth and eighteenth centuries; and pantheists spiritual monists, the stoics, and Spinoza.

Besides the works of those mentioned above, see A. E. Taylor, *Elements of Metaphysics*, 1903; H. Driesch, *The Possibility of Metaphysics*, 1924; E. A. Burtt, *Metaphysics the Foundation of Modern Physical Science*, 1925; I. C. Isham, *Metaphysics and Modern Research*, 1927; B. Russell, *An Outline of Philosophy*, 1927; J. Laird, *Modern Problems of Philosophy*, 1928; J. Mackenzie, *Outline of Metaphysics*, 1929; F. H. Bradley, *Appearance and Reality*, 1930; J. E. McTaggart, *Philosophical Studies*, 1934; M. Heidegger, *Kant und das Problem der Metaphysik*, 1934; C. E. M. Joad, *Guide to Philosophy*, 1936; and W. D. Ross, *Aristotle*, 1937.

Metasequoia, genus of trees which is closely allied to the *Sequoia* (q.v.) or *Wellingtonia*. Up to 1945 it was known only from paleobotanic specimens as a fossil age tree. But in that year were discovered three trees in N.E. Szechuan, near the Hupeh border, which were subsequently identified as the same species known by the paleobotanists. It was known that the species *M. glyptostroboides* was widely distributed, but it was on the verge of extinction. Expeditions to Szechuan in 1946-47 located in all only 100 trees. The largest was found to be more than 108 ft. high and about 7½ ft. in girth and, like the *Larix* and *Taxodium*, it is deciduous. Many genera which existed during the Mesozoic or Triassic eras are known to us only through fossilized remains, although some examples exist, as in *Ginkgo biloba*, 'the maidenhair tree,' of genera which have survived until the present day.

Metastasio (originally Trapassi), Pietro Antonio Domenico Bonaventura (1698-1782), became court poet in Vienna under Charles VI. in 1730. He is famous as a librettist through his association with Mozart (q.v.), who composed *La Clemenza di Tito* to a 'book' by M. Other composers who availed themselves of his writings were Handel, Porpora, Scarlatti, Paisi, Hasse, Gluck, Ressiger, Jommelli, Spontini, and Cimarosa. M.'s poetry was fluent and rich rather than dramatic; and the absence of strong climax would have been fatal in an age whose composers

studied declamation and prosody, apart from the higher ideals of opera. His chief efforts were *Didone abbandonata* (1724); *Catone in Utica*; *Ezio* (1732); *Olimpiade* (1733); and *La Clemenza di Tito* (1752).

Metauro, riv. of central Italy, which rises in the Apennines and, flowing N.E., enters the Adriatic Sea 10 m. S.E. of Pesaro. Length 68 m.

Metaxas, John (1871-1941), Gk. general and statesman, b. in Ithaca, entered the military academy at the age of twenty, and fought in the unsuccessful Thessalian campaign against Turkey (1897). He studied military science in Germany, and became prof. in the Gk. military academy (1903) and, later, joined the general staff, serving with distinction in the Balkan wars of 1912-13, and becoming chief of staff. He disapproved of Gk. intervention in the First World War, and having quarrelled with Venizelos, was forced to flee to Italy. For years after the war he was in opposition to Venizelos. In 1935 he joined the gov. as minister without portfolio at the time of Venizelos's abortive military and naval coup, and later played an important part in the restoration of King George II. Becoming minister of war and then Prime Minister, he assumed the rôle of dictator, and projected drastic reforms in all branches of Gk. life. After strengthening the armed forces and fortifying the frontiers, he pursued a prudent and statesmanlike foreign policy primarily based on a close understanding with Turkey. On the outbreak of war in 1939 he tried to organise, with Turkey, a solid Balkan combination, but was not successful. When Italy invaded Greece in 1940 he led Greece in her gallant resistance. See WORLD WAR, SECOND, *The Fall of Greece*; GREECE, HISTORY; GREECE, SECOND WORLD WAR CAMPAIGN.

Metayer System, system of land cultivation, in vogue principally in France and Italy, which has been evolved mainly by compulsion of circumstances as a result of the decay of feudal serfdom. Under this system the peasant landholder or cultivator pays no fixed rent either in money or kind, but tills the soil for the landowner on condition of receiving half (hence the name from Low Lat. *mediarius*, in its turn derived from *medius*, middle) its produce or some other proportion (in Italy usually two-thirds) thereof; while the landlord furnishes the whole or part of the stock, tools, and implements of husbandry. A true peasant proprietor has the strongest of incentives to make his holding a success; but the quasi-partnership of metayage can, strictly speaking, be dissolved at will by the landowner, or, what amounts to the same thing, be rendered impracticable by a perfectly legal augmentation of demands on the part of the dormant partner. For an appreciation of the merits of the system see J. C. L. de Sismondi's *New Principles of Political Economy*, book III, 1819, and J. S. Mill's *Principles of Political Economy*, chap. viii., 1848.

Metazoa. The animal kingdom is broadly divided into two main sections, the Protozoa and the M. The former are typically unicellular, though they in many

cases exist in colonies; Ms. are multicellular, and include all the higher forms of animal life. The place of sponges in this classification was long disputed. They are now considered to be definitely Metazoic.

Metcalf, John (1717-1810), Eng. road and bridge builder, b. at Knaresborough, of poor parents. He lost his eyesight, when six years old, in consequence of small-pox, whence his nickname 'Blind Jack of Knaresborough.' He was taught the violin to enable him to earn a livelihood as a strolling player, but he soon proved that his resourcefulness and courage allied to a robust physique (he was 6 ft. 2 in. tall) could rise superior to adversity. Early he became a good rider and swimmer, huntsman and cock-fighter. He married a publican's daughter and is said to have proved a model husband. In the '45 rebellion he was a recruiting sergeant on the King's side and actually fought at Falkirk and Culloden. He then set up a stage-coach between York and Knaresborough (1754) and familiarised himself with the Eng. N. roads. It was this that led to his career as a pioneer road-maker and bridge-builder. In 1765, Parliament having passed an Act authorising the construction of a new turnpike road between Harrogate and Boroughbridge, M. offered to construct a portion of the road. The master surveyor, having confidence in his skill, let him the whole contract. M. devoted himself wholly to this new task and completed it with entire success. Altogether he constructed nearly 200 m. of turnpike roads and eventually retired to a small farm (1792). See Smiles's *Telford* (1867) and histos. of Knaresborough by Hargrove (1809) and Calvert (1844).

Metchnikov, Ilya (1843-1916), Russian biologist, b. at Ivanavka, son of Maj.-Gen. Ilya M., of noble Moldavian descent. Educated at the high school and univ., Kharkov, he graduated at nineteen, and went to Heligoland to study marine organisms. At Giessen he worked under Leuckart, with whom he went to Göttingen; at Munich under Siebold, and thence to Naples. Returning to Russia in 1867 he became docent in zoology at Odessa and St. Petersburg, being appointed prof. of zoology and comparative anatomy at Odessa 1870. With Kowalevsky he laid the foundations in 1866-1886 of the cellular embryology of the invertebrates. In 1882 he removed to Messina, and pub. his *Intra-Cellular Digestion*, the first intimation of the function of the white corpuscles of the blood. He became director of the new bacteriological laboratory at Odessa, 1886. In 1888 he went to Paris, where a laboratory was provided for him by Pasteur at the Ecole Normale. In 1892 he issued *The Comparative Pathology of Inflammation*, showing curative nature of inflammatory process. In 1901 *Immunity from Infectious Diseases* attributed immunity to activity of phagocytes. *The Nature of Man* (1903) discussed among other things the cause of the decrepit state known as old age, mainly, poisonous matter formed

in large intestine. Wrote also *Optimistic Essays* (1907); *The Prolongation of Human Life* (1910); and monographs on various invertebrates. See life by his second wife, 1922.

Metellus, distinguished plebeian family of the Cecilia gens at Rome.

L. Caecilius Metellus was consul in 251 B.C., when he defeated the Carthaginians in Sicily at Panormus; consul a second time in 249; and afterwards pontifex maximus; while holding the latter dignity he rescued the Palladium when the temple of Vesta was on fire, and lost his sight in consequence.

Q. Caecilius Metellus Macedonicus, prator in 148 B.C. In 146 he defeated the Achaeans near Thermopylae, and on his return to Rome obtained a triumph and the surname Macedonicus for his conquest of Macedonia. M., in his consulship (113), was sent into Spain, where he remained two years and gained several victories, but was succeeded in the command before the conclusion of the war by Q. Pompeius. Pliny cites M. as an extraordinary example of human happiness. 'For besides the possession of the highest dignities,' says Pliny, 'and having obtained a surname from the conquest of Macedonia, he was carried to the funeral pyre by four sons, of whom one had been prator, three had been consuls, two had enjoyed a triumph, and one had been censor' (*Historia Naturalis*, vii. 45).

Q. Caecilius Metellus Numidicus, consul 109 B.C., carried on the war against Jugurtha in Numidia with great success, receiving in consequence the surname of Numidicus. In 107 he was superseded in the command by Marius. In 102 he was censor, in which capacity he expelled Servilius Glauca and Appuleius Saturninus from the senate, and two years afterwards (100) he was banished from Rome through the intrigues of his enemies Marius and Saturninus, who had returned to the senate. He was, however, recalled in the following year (99), but was probably poisoned shortly after his return. M. was one of the chief leaders of the aristocratic party, and a man of unsullied character.

Caecilius Metellus Pius, son of the preceding, received the surname of Pius on account of the love which he displayed for his father when he besought the people to recall him from banishment in 99 B.C. He was prator 89, and one of the commanders in the Marsic or Social war. He subsequently fought as one of Sulla's generals against the Marian party, and was consul with Sulla himself in 80. In the following year (79) he went as pro-consul into Spain, where he carried on the war against Sertorius (79-72). From the year 76 B.C. Pompeius was his colleague, and they triumphed together at the end of the war. M. was pontifex maximus, and on his death (63) he was succeeded in that dignity by Julius Caesar.

Q. Caecilius Metellus Pius Scipio was the son of P. Scipio Nasica, prator in 64 B.C. Pompey married Cornelia, the daughter of M. Scipio, in 52, and in the same year made his father-in-law his

colleague in the consulship. Scipio fought on the side of Pompey in the civil war, and after the battle of Pharsalia crossed over to Africa, where he received the command of the Pompeian troops. He was defeated by Caesar at the battle of Thapsus in 46, and shortly afterwards he committed suicide.

Q. Caecilius Metellus Creticus, consul 69 B.C., carried on the war against Crete, which he subdued in the course of three years.

L. Caecilius Metellus, brother of the last, praetor 71 B.C., and as propraetor the successor of Verres in the gov. of Sicily.

Quintus Caecilius Metellus Celer was praetor in 63 B.C., when he commanded three legions in the war against Catiline, whom he prevented from crossing the Apenines and so crossing into Gaul. He became consul in 60, in which capacity he opposed Pompey and the aristocratic party, especially in the matter of the Agrarian laws. He d. in 59.

Metempsychosis, see TRANSMIGRATION.



E.N.A.

THE WILLAMETTE METEORITE: 16½ TONS
(OREGON, U.S.A.)

Meteorite. Meteors (q.v.) are occasionally large enough to reach the earth's surface before they have vaporised. The name given to such stones is Ms. They are generally of an igneous nature, containing large proportions of iron and smaller amounts of nickel, chromium, and magnesium. The approach of a M. is signalled by the appearance of the large incandescent meteor, known as a fireball, and the enormous air-currents set up by the compression of the air in front of the meteor moving with a speed of several m. per sec. The sound waves thus created give the impression of a thunderclap. The speed of the meteor is rapidly diminished by the increased air-resistance as it approaches and it ceases to be incandescent and breaks up into fragments. It is these fragments that are called Ms., and they vary in size from small grains to enormous masses weighing 50 tons or more. Ms. of the latter size are extremely rare; a well-known one fell in Siberia in 1908; its impact was recorded on seismographs in England and the air-currents destroyed forests over a large area in Siberia. Another large M. fell in the Amur R. valley, E. Siberia in 1947. The largest M. crater is in Arizona. Less than

ten Ms. have been found in England. The metallic kind of Ms. are also called siderites, those of the stony kind aerolites. These latter are analogous to the nitrabasic rocks of the crust of the earth.

Meteoritic Hypothesis. Sir N. Lockyer, in a work entitled *The Meteoritic Hypothesis* (1890), endeavoured to show that nebulae are composed of sparsely aggregated swarms of Ms., and that stellar systems are evolved from them. The light emitted by nebulae is assigned to the collision of the Ms. with one another, the aggregate result of many collisions affording a constant emanation of light. The theory being based on spectroscopic evidence it remains to be explained why the spectra of these nebulae never show metals, but only hydrogen, helium, and nebulium.

See Fletcher, *An Introduction to the Study of Meteorites*; Prior, *Guide to the Collection of Meteorites in the British Museum*. See also Acts xix. 35.

Meteorograph, instrument which gives a continuous record of the fluctuations in the temp., pressure, and humidity of the atmosphere. One type consists of a combined thermograph, barograph, and hydrograph, and lines are plotted on a cylinder which, driven by clockwork, revolves once in about 8 hrs. Made of aluminium and enclosed in a cage, the whole apparatus only weighs about 30 to 40 oz., and is attached, for use, about 60 ft. below a kite. The more usual light variety can be used with hydrogen-filled balloons rising to the stratosphere. Thus a continuous record of the meteorological conditions prevailing at various heights in the atmosphere is obtained. The development of radio-sonde is limiting the use of Ms.

Meteorological Office, estab. in 1854 under the Board of Trade and transferred in 1867 to the control of the Royal Society, the issue of forecasts and warnings being suspended until 1874, when it was resumed under pressure from the Board of Trade and the public. Since 1919 the M. O. has been administered by the Air Council (q.v.). The responsibility for the work of the Brit. Rainfall Organisation was transferred to the M. O. in 1919. The M. O. maintains numerous stations for daily telegraphic reports on which weather forecasts and warnings of gales are based, and also stations in various parts of the country for giving meteorological information to aircraft. It also collects and discusses meteorological observations from ocean and land areas all over the world, and maintains observatories for weather study and cognate subjects. The Cassiob Committee of the Royal Society advises the M. O. on geophysical subjects. Pubs. of the M. O.: *Daily Weather Report*, *Daily Aerological Record*, *Weekly Weather Report*, *Monthly Weather Report*, *Meteorological Magazine*, *Marine Observer*, *British Rainfall*, *Observatories' Year Book*, *Réseau Mondial*, *Professional Notes*, *Meteorological Reports*, *Geophysical Memoirs*, and *Meteorological Glossary*; also handbooks, manuals, text-books, and tables of frequencies and averages.

Meteorological Society, Royal. The first Eng. society was founded in 1823 and was followed by the M. S. of London, which existed from 1836 to 1842. The Brit. M. S. was initiated in 1850 and assumed its present designation as R. M. S. in 1882. The Scottish M. S. amalgamated with the R. M. S. in 1921. Pubs. of the society: *Quarterly Journal, Weather, Bibliography of Meteorological Literature, Phenological Report, Memoirs, Reports of the Council, and Proceedings, Meteorological Record*, which contained statistical data, is now superseded by publs. of the Meteorological Office, such as the *Monthly Weather Report*. Offices: 49 Cromwell Road, London S.W.7.

Meteorology is the science which deals with the study of atmospheric conditions and changes which mainly constitute the weather. Apart from some observations included by Aristotle in his book *Meteorologia*, very little was accomplished in the direction of making M. an exact science until the end of the sixteenth century, when Galileo and the Florentine academicians constructed the first thermometer of any importance, and when Torricelli in 1643 discovered the principle of the barometer. The work of Boyle on gases, and that of his assistant, Hooke, on barometers, advanced the physical basis of M. Hooke actually constructed a barometer with the weather indications, a practice which is still followed. The invention of a superior mercury thermometer by Fahrenheit provided further means for the record of weather elements. In the early years of the nineteenth century a chain of meteorological stations was estab. in France, and weather maps were constructed from the data collected. The first weather map in England showing the trade winds and monsoon was made in 1688, and the first telegraphic weather report appeared on Aug. 31, 1848, in the *Daily News*, but was suspended after three months; after considerable demand the report was resumed on an improved basis in March 1849. The first daily telegraphic weather map was prepared at the 1851 exhibition, but the Meteorological Office was not estab. in London until 1854. It was then founded as a dept. of the Board of Trade under the direction of Adm. Fitzroy; since 1919 it has formed part of the Air Ministry. In 1860 Adm. Fitzroy began the first regular daily collections of weather observations by telegraph and with them produced the first Brit. daily weather report, the first daily printed maps appearing in 1868. The advance of M. since the inventions of the telegraph, telephone, and wireless has been extremely rapid; for these made possible that rapid collection of data at headquarters, most essential in the production of a useful forecast.

With the growth of aviation and scientific planning M. has grown in importance. Meteorological services throughout the world have increased in both size and complexity. Observations are collected, not only from thousands of land stations, but also from special weather ships, from aircraft, and from self-recording and

automatic transmitting stations, such as the radio-sonde (*q.v.*). Recently the invention of radar (*q.v.*) has brought a new instrument which can 'map' a rain cloud, a thunderstorm, or even a tropical storm on a small screen. Atmospherics, so annoying to the radio listener, have been traced to thundery activity, and specially equipped stations pick up bearings of these storms so that it is possible to plot all activity within a thousand miles or so. Weather knows no boundaries or frontiers. All countries unite in the International Meteorological Organisation (soon to become the World Meteorological Organisation) of which the directors of the meteorological services of all countries form the supreme authority, the 'Conference of Directors,' under whom, to make recommendations, are various commissions and sub-commissions of specialists for such subjects as agric. M., climatology, instruments and methods of observation, synoptic weather information, etc. There are also six regional commissions, one for each major continental region of the globe.

The atmosphere consists of a mixture of gases, of which oxygen and nitrogen account for about 99 per cent, together with small quantities of argon, carbon dioxide, helium, hydrogen, krypton, neon, ozone, radon, and xenon; to these gases, which are in almost fixed proportions, are added very variable amounts of water vapour, water and ice drops, and smoke, dust, and other particles which are so small that they are kept up in the air by turbulence. None of the gases can be seen, not even the water vapour, but smoke and dust particles are often visible as haze, and the water and ice drops can be seen as mist, fog, cloud, drizzle, rain, snow, or hail. The nature of M. is to describe, record, explain, and forecast the changes in the quantities of these elements, including also the changes in physical state of the air.

OBSERVATIONS.—It is not possible to examine the air in great detail over even part of a small country like England; the next best thing is to examine the weather at a few places in very great detail, and have a large number of places where the examination is neither so detailed nor so rigorous. Observing stations may be classified as follows:

Observatories, where reliable standard and absolute measurements are made as far as possible with autographic instruments, which are often duplicated for checking and research purposes. Some elements such as atmospheric electricity, solar radiation, etc., are measured only at observatories and other research estabs. Kew is the main meteorological observatory in Britain, but other observatories are at Greenwich (where M. is only a small side-line), Eskdalemuir in the S. uplands of Scotland (where the earth's magnetism is the chief interest), Lerwick in the Shetlands (where the aurora is also studied), and Valentia in S.W. Ireland. Most observatories send in reports by telegraph, as do synoptic stations (*see below*), but their main purpose is research

and standardisation; their observations are pub. by the Meteorological Office in the *Observatories' Year Book*, which contains hourly values of the observations.

Climatological Reporting Stations report the general daily weather conditions, and make one or two observations at standard hours during the day so as to provide the cumulative data, such as average temp., maximum and minimum temps., rainfall, sunshine, mean pressure, days of fog, frost, snowfall, and of the extent and persistence of snow-cover. After statistical analysis, climatic charts and tables are constructed containing the frequency of the different weather elements, such as gales, frost, etc. This information is invaluable for planning; it is used more and more by agriculturists, architects, engineers, and many industrialists. Climatic information from the hundreds of Brit. stations is pub. in the *Monthly Weather Report*, and periodically in tables of averages and frequencies.

Crop-weather Stations make special observations for use in agric. M., where, besides the more obvious necessity for long-period or seasonal forecasts, the elements of the weather need to be studied in very close detail, micrometeorology or microclimatology as it is called. Most agric. plants grow no higher than 4 ft., and it is necessary to know the temp., humidity, and wind in great detail at heights less than this to be able first to study, and then to control the plant diseases spread by the aphid or wind-borne virus. The details of frost hollows and the sharpness of frost necessary to damage a plant must all be studied.

Rainfall Stations, of which there are nearly 5000 in Great Britain alone, measure the amount of rain that falls. Most stations measure the daily amount, but some stations in out of the way moorland areas only measure the rainfall monthly. Their observations are pub. in an ann. vol. *British Rainfall*, a selection being pub. every month in the *Meteorological Magazine*.

Synoptic Reporting Stations, where observations are made simultaneously throughout the world, report in a mutually agreed form so that the observations at any one station can be compared directly with the observations at any other. These observations are mainly for and restricted to the elements considered essential for forecasting; they have to be brief and easily assimilated into code form suitable for rapid transmission to all parts. The code used is an international one; it is formulated by the Commission for Synoptic Weather Information of the International Meteorological Organisation. Reports are received at a national centre and a selection broadcast immediately for use by all other countries. Reports from more than fifty Brit. stations are broadcast regularly every 6 hrs., and almost as many every 3 hrs. Similarly large numbers of stations report at the same intervals from all other countries, from Greenland, N.W. Canada, Spitsbergen, and the wastes of Siberia and Lomonosov Land (Franz Joseph Land) to Tristan da Cunha, and

the lonely outposts of Graham Land in Antarctica.

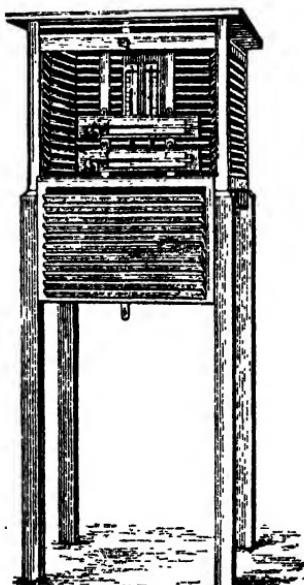
Meteorological observations, for whatever purpose, must be clear, precise, and strictly comparable between one station and another. It is easy to decide whether it is fine or cloudy, or if there is a thunder-storm; the distinctions between rain, snow, and hail are obvious; sleet is wet snow, melting snow, or a mixture of rain and snow; soft hail is half-way between snow and hail; and drizzle, which consists of very small drops, is half-way between rain and cloud, the water drops being just large enough to fall to the ground. It is useful also to describe the rain as showery, intermittent, or continuous, as light, moderate, or heavy. More precise measurements of rain can be made with a rain-gauge (*q.v.*); this will give the total rainfall during a given period or even from some types of gauge the rate of rainfall. Wind strength and direction can be measured in great detail by anemometers and wind vanes, but its general run can also be measured solely by observation of wind effects on natural objects, using a wind scale which was devised by Adm. Beaufort in 1806. This was originally based on the amount of sail it was possible to carry on a man o' war. Each Beaufort force has been trans. into the equivalent effect on land (rustling in leaves, whistling through telegraph wires, blowing down of chimney pots, etc.), and also into the equivalent wind speed in m.p.h. or knots (see further under WIND). Clouds are closely related with the other weather conditions and careful observations of the amount and types of cloud are made, the classification following broadly that given by Luke Howard in the early nineteenth century, but brought up to date as a result of closer observation from aircraft and a greater understanding of the physical processes forming the clouds (see further under CLOUD). Fog (*q.v.*) may be thought of as cloud on the surface; it can indeed be cloud on the surface which drifts with the wind (as in sea and hill fogs); fog can also form on clear, quiet nights by the contact of the air with the cooling earth, the air then becoming saturated and condensing some of its water vapour into droplets. In M. an arbitrary distinction is made between fog and mist; objects being visible at more than 1 km. in mist, but not in fog.

Above any place the atmosphere extends vertically for some 200 m. or more, and, although some indication of the condition of the air above can be deduced from cloud observations, actual measurements of the physical state of the atmosphere are made at as great a height as possible. The weight of the air above any point presses downwards, producing a force in all directions which is called the air pressure; it is measured by barometers and barographs, the unit of measurement being the millibar (mb.). With increase in height there is less air above and therefore pressure decreases with height. Providing the temp. of the air is known it is quite easy to calculate this decrease in pressure; near sea level it amounts to

about 3 mb. in every 100 ft. Since it is useful to compare pressures between many stations at a constant level pressures are 'reduced to sea level,' i.e. a suitable correction is added to or subtracted from the pressure as read by the barometer to find out what it would read if it were at sea level in the same place. To measure the temp. of the air is more difficult, for a thermometer gives the temp. of itself, not necessarily of its surroundings. In addition the temp. varies irregularly with height, particularly in the first few feet above the earth's surface. On a hot sunny afternoon the temp. at 4 ft. may

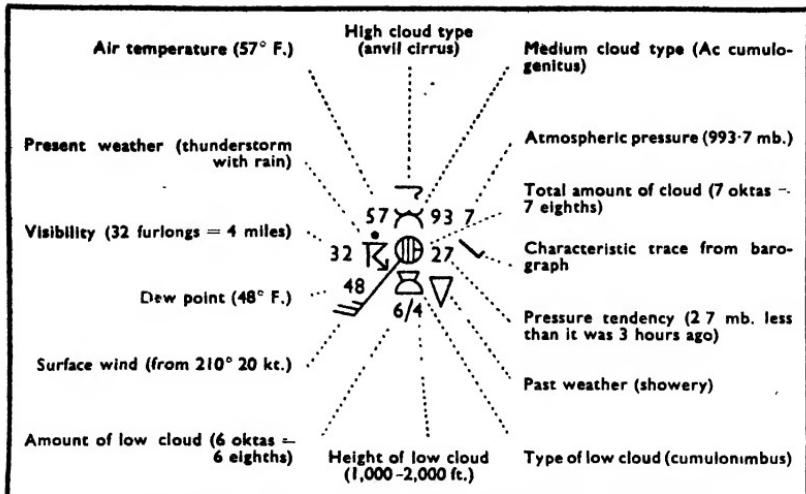
lose by radiation is continually balanced by transference of heat to or from new quantities of air. This is the principle behind the sling psychrometers, which are whirled through the air; aspirated thermometers, which suck the air mechanically past the thermometer bulbs; or thermometers attached to aircraft (in this last case the motion is too rapid and a correction has to be applied to counter the heating of the thermometer by compression of air against it). The humidity of the air is found by comparing the temps. measured by the ordinary thermometer and by one whose bulb is covered by moist muslin (*see further under HYGROMETER*, where other methods of measuring humidity are also described). The temp. and humidity in the upper air are measured by attaching instruments to an aircraft, to a small balloon, or even to a rocket. With aircraft measurements have been made up to more than 50,000 ft., with balloons to 100,000 ft., and with rockets to more than 100 m. At first balloon-carrying instruments had to be recovered before any results were obtained; now, with the invention of short-wave radio, the radio-sonde balloon transmits the observations to earth. Balloons can also be used to measure the winds aloft, for, since they are carried by the wind, following their movement by theodolite, direction-finding radio or radar will enable their drift to be calculated, thus determining the winds at the different heights through which the balloon passes. Reports from ships follow exactly the same patterns as those from land stations, but also include the sea temp. and the state of the sea. Recently ships have been specially equipped to cruise at a fixed 'ocean weather station' making observations, including radio-sonde ascents at the standard intervals. These ocean weather ships are also used as navigational beacons for transoceanic aircraft, and provide rescue services if required. Transport and other aircraft also make reports. Special meteorological aircraft fly at a constant height, occasionally measure the sea-level pressure (by flying at a very small known height above the sea), and describe the weather as they fly along. Normally they make an ascent from near sea level to about 18,000 ft. and, a little further on, a descent, thus obtaining the same data (to the limited height reached) as by two radio-sonde ascents. Before the estab. of ocean weather ships many meteorological flights used to cover large stretches of the Atlantic, but they are not so numerous there now. New routes are, however, being flown, one of which is from Alaska to the N. pole and back.

ANALYSIS OF OBSERVATIONS. — The huge mass of synoptic data collected and disseminated for forecasting purposes is plotted on synoptic weather charts in a form suitable for rapid and easy assimilation. The weather elements are plotted round a station circle in a fixed order, with symbols and figures agreed internationally. Modified copies of these charts are pub. daily by most meteorological services. The



STEVENSON SCREEN
Front view with door open.

easily be 5° F. or 10° F. lower than the temp. near the surface, whereas on a following clear night the reverse usually occurs. On the other hand the temp. of air which rises 100 ft. only cools about 1° F. by reason of its change of height and consequent expansion due to decrease in pressure. Therefore temps. are read at a standard height (usually 4 ft.) above the surface, and not reduced to sea level. To make the thermometers the same temp. as the air they are sheltered in a Stevenson screen which protects the thermometers from radiation from sun or earth by white wooden walls which are double-louvered to allow the air to circulate freely. An alternative method is to make the air blow so rapidly past the thermometers that any heat they may gain or

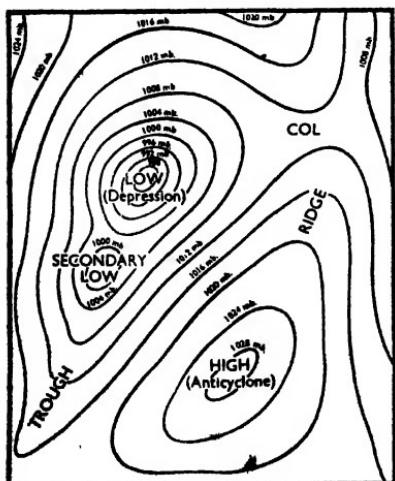


SPECIMEN OF PLOTTING OF THE WEATHER AT A STATION ON A SYNOPTIC CHART

Brit. *Daily Weather Report* is divided into three sections, and contains a detailed map of the weather over the Brit. Isles, and also a less detailed map of the weather over the N. hemisphere, and the *Daily Aerological Record* contains full reports of the radio-sonde ascents made over the Brit. Isles, and from some of the ocean weather ships, together with maps of the heights of the 700 mb., 500 mb., and 300 mb.

pressure surfaces which give a picture of the winds at 10,000 ft., 18,000 ft., and 30,000 ft.; there is also a map of the height of the tropopause. Ships' reports are plotted on the same charts, using the same symbolic form. Data from radio-sondes and aircraft are plotted on upper air charts and on temp.-height diagrams, the diagram in use in Britain being the thermogram (g.r.). With the help of this diagram it is possible to predict the formation or otherwise of clouds, showers, or thunderstorms, and sometimes to identify where the air comes from (*see also WEATHER FORECAST*).

In the early days of weather charts, when few stations were available, the features that seemed to stand out most clearly were the easily recognisable patterns made by isobars (lines joining places of equal pressure), forming regions of low pressure (depressions or cyclones), regions of high pressure (anticyclones), and the connecting patterns: ridges, troughs, cols, and secondary depressions. It was soon noticed that the wind bore a definite relation to pressure which was enunciated by Prof. Buys Ballot of Utrecht in 1857 in the form 'that, in the N. hemisphere, if you stand with your back to the wind, pressure is lower on your left hand than on your right, while in the S. hemisphere the reverse is true.' This law was later confirmed by a dynamical formula based on physical principles which gave a theoretical speed and direction to the wind in the free atmosphere, known as the gradient wind. This wind blows along the isobars with low pressure on the left in the N. hemisphere with a speed proportional to the gradient of pressure between the isobars (the closer the isobars are together, the stronger the wind). It



	haze		fog		shower of hail
	waterspout		intermittent slight drizzle		shower of rain
	snowstorm		continuous slight rain		slight thunderstorm with rain
	sandstorm		continuous heavy snow		heavy thunderstorm with hail

SOME EXAMPLES OF INTERNATIONAL WEATHER SYMBOLS

is increased by a smaller quantity for anticyclonic curvature, and decreased similarly for cyclonic curvature of the isobars. The effect of the curved isobars is normally small enough to neglect; then the theoretical wind is known as the geostrophic wind. However, both the gradient and geostrophic winds neglect change of pressure with time and vertical motion, as well as frictional forces. These terms are all generally small and the wind speed at about 2000 ft. above the surface may be read off the synoptic chart by placing a scale appropriate to the lat. across the isobars. The surface wind is affected considerably by friction and the configuration of the land, especially in hilly regions where it tends to blow along the valleys; the speed is usually less than the gradient wind, and the direction at an angle (often 20-30°) across the isobars from high pressure to low. The effects neglected by the gradient-wind equation are important, for it is these that lead to inflow of surface air into regions of low or falling pressure and, conversely, of outflow from regions of high and rising pressure. If the surface air is flowing into a region then the air must escape by rising and spreading out aloft; this leads to adiabatic cooling and instability, cloud, and unsettled weather; conversely diverging air leads to subsidence, adiabatic warming, stability, clear skies, and settled weather. These theories are, in general, confirmed by the observation of unsettled weather in cyclones and quiet weather in anticyclones. When air blows over hills and mts. it is forced to rise and, if it contains enough moisture, cloud is formed; if the process continues long enough or the air is very moist or unstable, rain falls. This type of rain is calledographic rain, and is very prevalent on coasts exposed to frequent winds from the sea. Even if rain is not formed (if, for instance, the moist layer is only shallow) drizzle sometimes occurs, and even very low hills may be shrouded in cloud; these are the conditions of a 'scotch mist' in the W. Isles or the 'crachin' of S. China. Areas sheltered from these winds, which have lost some of their moisture on the hills, are likely to have finer and drier weather.

During the First World War Norwegian

meteorologists, notably V. and J. Bjerknes, using a very close network of reporting stations, discovered that the change from one relatively homogeneous type of air mass as it is called—to another was often very rapid and usually along a clearly marked line. These lines were called fronts. Near fronts are regions of widespread cloud, rain, or snow, as will be shown later; the air masses, however, also exhibit many different weather characteristics according to whether they are moving from colder to warmer regions or vice versa, and whether they contain much or little moisture. If they move to warmer regions the lower atmosphere becomes warm and the air becomes unstable, leading to cumulus cloud and showers (see further under TRIGRAM); if they move to colder regions the lower air becomes colder, and may therefore develop fog or a very low cloud sheet known as stratus. At first the air masses were called polar or tropical, but present practice is to classify the air masses broadly according to where they originate as a more or less homogeneous mass, laying stress on both humidity and temp. They are:

Arctic or Antarctic Air, which originates over the polar ice-caps, Greenland, and Antarctica, and on reaching low lats. is very cold and unstable; it carries little moisture even if saturated. As it passes over unfrozen seas, cumulus, cumulo-nimbus, and showers develop; the showers are very frequent on exposed coasts.

Polar Continental Air, which may be even colder than arctic air at low levels; it is not so cold aloft, is stable and very dry, having its origin in winter anticyclones that persist over Russia, Siberia, and Canada. When passing over the sea convection clouds develop more slowly than with arctic air; stratus or stratocumulus appear first, shower cloud develops after a comparatively long sea track. The coldest temps. in England are recorded when this air mass comes from the E., since it has only a very short sea track.

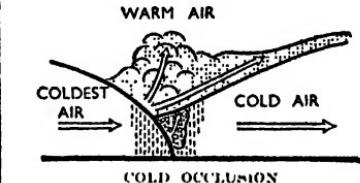
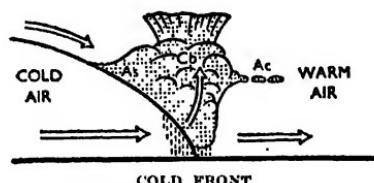
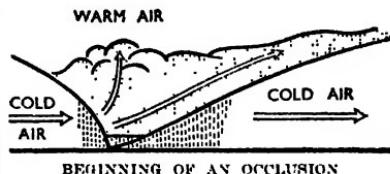
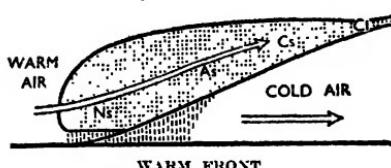
Polar Maritime Air, which is formed when arctic air has been for some time over the ocean or may form in both anticyclones and stationary depressions over the oceans in high lats. It is moist and

unstable, and very prolific of cumulus, cumulonimbus, and showers. It is the commonest air mass over the Brit. Isles.

Tropical Maritime Air.—This forms in subtropical anticyclones (such as the semi-permanent Azores anticyclone), and is moist and stable. It brings muggy conditions to Britain with S.W. winds. It is moist and stable with sea fog or very low stratus cloud very prevalent over the S. and W. coasts of Britain. The top of the cloud is rarely above 5000 ft., often only about 2000 ft., with clear blue skies above.

Tropical Continental Air, which accumulates over the hot continents in summer, mainly central Asia, Africa, mid U.S.A., and Australia. It is very unstable, but dry, so rarely contains any cloud. It is hazy, and, with rising winds,

it upwards. This is not a convective process, although latent instability (see TERPHIGRAM) may become active after some lifting has taken place, and produce convection. Sheet clouds are therefore formed, and steady rain falls. Generally rain begins to reach the ground when the cloud base comes below about 10,000 ft.; since the warm front slopes at about 1:100, the rain belt at a warm front is about 200 m. wide, following a 'pre-frontal' cloud belt 400 m. wide. The haloes which can be seen through the cirrostratus of a warm front are therefore usually a sign of coming rain. The cold front normally has a slope twice as steep as that of the warm front, so that the rain belt is not so wide; further, the warm air high up at the rear of the cold front often travels faster than the cold air beneath, so



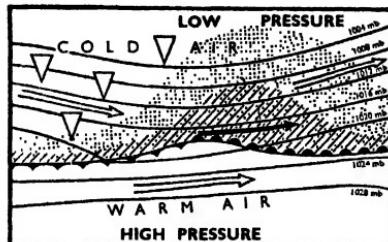
For the meaning of abbreviations of cloud types see CLOUD.

picks up sand from the deserts to form sandstorms, such as the khansin or ghibli in Egypt. When tropical continental air from the Sahara crosses the cooler Mediterranean Sea it picks up moisture and brings hot, oppressive, damp conditions; it is known as the scirocco.

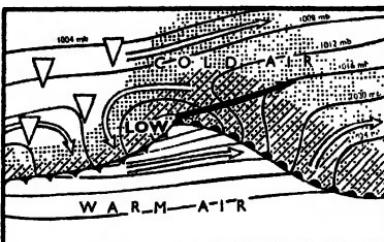
Equatorial Air.—This exists in a wide semi-stagnant belt near the equator; it is hot, moist, and unstable, with cumulus cloud, which develops into cumulonimbus and heavy showers or thunderstorms when it passes over the land in the afternoon. Because of the high moisture content it is very uncomfortable, and the very dry tropical continental air, which sometimes replaces it in W. Africa, is therefore known as the harmattan or 'doctor.'

Fronts.—At the transition zone between two air masses the warmer air, being lighter, rides over the colder, so that, providing the following air is moving the faster relative to the front, when warm air replaces cold (a warm front) the warm air slides above the cold, and when cold air replaces warm (a cold front) the cold air undercuts the warm air and pushes

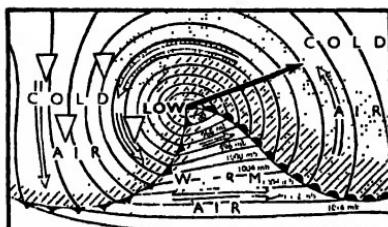
that it slides down the cold front, which, in that part, is therefore free from cloud. Instability often develops at a cold front, and then the frontal cloud no longer remains in sheet form, but develops into cumulonimbus with heavy rain or even thunder. If, owing to friction, the warm surface air is held back, it gets trapped by overrunning cold air, which causes violent turbulence leading to a line-squall with a typical roll cloud. When a cold front overtakes a warm front the cold air meets cold again, and the warm air is lifted entirely off the surface. This combined front is called an occlusion. If the cold air ahead is warmer than that behind, it too is lifted, the cold occlusion; if the cold air behind is warmer, it slides up above



1. Wave develops on an almost stationary front.



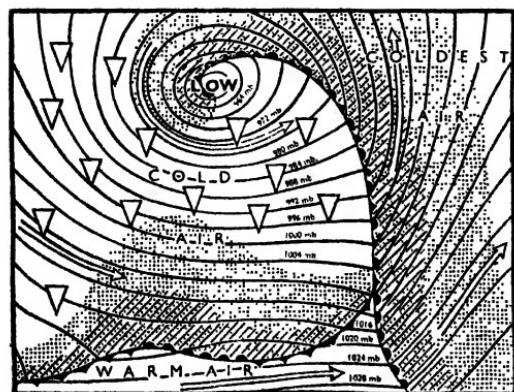
2. Wave develops a small centre of low pressure, the wind beginning to circulate round it.



3. The fully developed depression: the occlusion is beginning to form. The rain is a little in front of the cold front in some places.



4. The occlusion is now well developed (here a warm occlusion); the end of the cold front is becoming more parallel with the isobars and moves very slowly.



5. The occlusion has begun to curl around the centre of the depression, which is now moving quite slowly. A new wave has begun to develop on the almost stationary part of the cold front.

- ↑ Warm front
- ↓ Cold front
- ↔ Occlusion
- Direction of movement of low
- Direction of movement of air
- ▨ Rain area
- ▨ Area of frontal cloud sheet
- ▽ Area of showers
- Isobars

the former as at a warm front, the warm occlusion. When equatorial air replaces tropical continental air, as in the beginning of the S.W. monsoon in India, a monsoon front is formed which is a cold front below and a warm front above. This system has a very high latent instability, so that monsoon rains often break with a violent thunderstorm.

Formation of Depressions in the Temperate Zone.—The present theory of the formation of depressions, first stated by the Norwegian school of meteorologists, is that they start as small bends or waves in a more or less stationary front, with warm air inside the bend, which is convex towards the cold air. In favourable circumstances the depth of the wave increases, and the wave itself moves along the front, the first part of the wave acting as a warm front (warm air overtaking cold), and the rear part as a cold front. As the depth of the wave increases the air pressure falls inside and around it, and the winds in the neighbourhood increase. The cold front moves faster than the warm, begins to overtake it, and an occlusion is formed; eventually the cold air lifts all the warm air out of the circulation of the low or pushes it well away from the centre where the front then tends to become quasi-stationary; a new low may then develop. The process is illustrated on p. 203 with shaded areas representing the rain, dotted areas where the sheet cloud persists, and the international shower symbols where showers are most predominant.

Forecasting.—When once a synoptic chart has been analysed and the causes of the different weather phenomena in the different parts understood, it is possible to 'move' the different weather conditions along from one place to another by measuring the gradient wind, and making due allowance for such effects as large pressure tendencies, vertical motion, etc. Making allowance also for the different terrain which the new air masses and fronts would now occupy or have passed over, and for the different time of day, the weather a few hours hence may be described with a fair degree of accuracy. This is short-term forecasting; it is reasonably dependable for as much as twenty-four hours ahead. For longer periods the number of interdependent factors becomes so large that the task, except in a few typical and well-established situations, is far too complex for any real accuracy to-day (*see WEATHER FORECASTING*).

The Upper Air is now becoming a familiar region; it has long been known that the air temp. decreases from the ground upwards, except for certain levels known as inversions (associated with anticyclones or frontal surfaces) where the temp. may increase temporarily with height, and to an upper region called the stratosphere, where the temp. usually remains constant or with little change for several miles upwards. The level where the stratosphere begins is called the tropopause; below is known as the troposphere. The tropopause is at varying heights, being highest in equatorial air at about

50,000 ft., and lowest in arctic air at about 16,000 ft. Since the temp. decreases at high levels in the troposphere at about 4° F. or 5° F. in every 1000 ft. the coldest air temp. is found, not at the poles, but in equatorial lats. at the tropopause where it is highest. In the stratosphere, as has already been stated, the temp. remains fairly constant for some 20 m., but at a height of about 25–30 m. it has been found to increase again, reaching, at a height of some 40 m., temps. higher than any experienced on the earth's surface; it drops to a minimum again at about 50 m. up, and then increases to very high temps. These temps., which were originally estimated from the propagation of sound, and have recently been measured in America, using rockets, are still a little problematical, for the air is so thin at these great heights that it is doubtful what is meant by temp. Upper air charts, which are now drawn regularly, suffer from two great difficulties: the comparatively small number of observations, at best some 300 m. apart, except in the United Kingdom, and the difficulty of knowing the height of the observation with any degree of accuracy. The height of the observation is, in fact, except when modern radar methods are used, calculated from the measured temps. and pressures up to that height. The gradient wind equation still applies at the higher levels, but, because of the decrease in air density, the wind speeds are much greater for the same pressure gradient than they are at the surface. However, by using in the gradient wind equation the change in height for constant pressure instead of the change in pressure for constant height, this difficulty is overcome. Consequently upper air charts are now drawn with contour heights of the 700 mb., 500 mb., or 300 mb. pressure surfaces, taking the place of isobars (as in the *Daily Aerological Record*). Further charts are now drawn showing the difference in height between the 1000 mb. and 500 mb. pressure surfaces; the winds calculated from these charts represent not an actual wind, but the wind difference between the air near the earth's surface and the wind in the upper air, i.e. they illustrate the relative motion of the air at the two levels. Attempts are being made to extend the period of short-term forecasts by study of these charts, for their patterns have been found to change comparatively slowly. Additionally circulation indices (single figures expressing the total westerly wind current in a zone round the world) and other regional 'means,' as well as short-period mean pressure and temp. maps are being studied.

Seasonal forecasting has been attempted in the past, sometimes successfully, by correlating mean temp. and pressure at various chosen places over the globe with other elements such as the time of onset of the monsoon rains in India, with sunspot activity, with rainfall observations, and even with the extent or drift of polar ice. *See also CLIMATE; CLOUD; FOG; HYGROMETER; RAIN AND RAINFALL; TEPHIGRAM; THUNDERSTORMS; WAVES; WIND.*

(This article is pub. by permission of the director of the Meteorological Office.)

See H. C. Willett, *Descriptive Meteorology*, 1911, 1944; Sir N. Shaw, *Manual of Meteorology*, 1926, and *The Drama of Weather*, 1933, 1940; D. Brunt, *Physical and Dynamical Meteorology*, 1932, 1939; W. H. Pick, *A Short Course of Elementary Meteorology* (H.M.S.O.), 1938, 1947; Admiralty Hydrographic Dept., *Admiralty Weather Manual* (H.M.S.O.), 1938, 1941; R. C. Sutcliffe, *Meteorology for Seafarers* (H.M.S.O.), 1939, 1948; S. Petterssen, *Weather Analysis and Forecasting*, 1940; and Meteorological Office, *Meteorological Glossary* (H.M.S.O., 3rd ed.), 1949. Special journ.: *Meteorological Magazine* (H.M.S.O.), monthly; *Weather* (Royal Meteorological Society), monthly, and the *Quarterly Journal of the Royal Meteorological Society*.

Meteors, or **Shooting Stars**, consist of small portions of solid matter sometimes resulting from the breaking up of comets on a close approach to a giant planet or to the sun under the gravitational attraction of the latter. They exist in enormous numbers in the solar system, mostly comparable in size with grains of sand, and when they enter the earth's atmosphere from outer space become incandescent owing to the friction between the air and the M., which are travelling with velocities that may be as high as 40 m. per sec. or more. M. are occasionally sufficiently large to reach the earth's surface before they have been vapourised, and such stones have been called meteorites (*q.v.*). Thousands of millions of M. enter the earth's atmosphere every day, and on any clear night, after a few minutes' watching, the observer will see a shooting star, but at certain times in the year a large number of M. may be observed which appear to come from particular quarters of the sky. These are technically known as the 'radiant-points.' The periodicity of meteoric showers is due to the fact that the small particles of matter which form M. are subject to the universal law of gravitation and revolve round the sun in elliptical orbits in the same manner as do the planets. Whenever, therefore, the earth in its revolution intersects the orbit of the meteoric stream, there must occur a display of shooting stars, and as it occasionally happens that the earth passes through the nucleus of the stream, the display is then exceedingly brilliant. Chief among such periodic brilliant displays are the Leonids (Nov. 16), the M. of Pons-Winnecke's comet in June and those from Giacobini-Zinner's comet that appear in Oct. Prominent displays are listed under 'Meteors' in *Whittaker's Almanack*. The astronomical importance of M. arises from the evidence they afford of the orbits of their parent comets in whose wake the M. follow.

Meter, Electric, see ELECTRIC METER.

Meter, Gas, see GAS METER.

Methane, or **Marsh Gas**, CH_4 , the simplest hydrocarbon of the paraffin series. It is produced in nature by the decay of

vegetable matter under water, and thus rises in bubbles from marshes and swamps. It also occurs in the natural gas of petroleum dists., is set free from fissures in coal as 'fire damp,' and is one of the chief constituents of coal gas. It is prepared by heating a mixture of sodium acetate and soda lime, according to the equation: $\text{C}_2\text{H}_5\text{O}_2\text{Na} + \text{NaOH} = \text{CH}_4 + \text{Na}_2\text{CO}_3$. Better methods of obtaining the pure gas are (i.) the action of water on aluminium carbide: $\text{Al}_4\text{C}_3 + 12\text{H}_2\text{O} = 4\text{Al}(\text{OH})_3 - 3\text{CH}_4$, and (ii.) the action of dilute hydrochloric acid upon methyl magnesium iodide: $2\text{CH}_3\text{MgI} + 2\text{HCl} = 2\text{CH}_4 + \text{MgCl}_2 + \text{MgCl}_2$.

M. is a colourless, tasteless gas, which is liquefied at -11°C . under a pressure of 180 atmospheres. It burns with a pale blue flame and forms a highly explosive mixture with certain proportions of air or oxygen, the explosions in coal-mines being largely due to the ignition of such a mixture. It is almost insoluble in water, more soluble in alcohol, and is a very stable gas, resisting the action of a large number of reagents. When mixed with chlorine in the dark, no action occurs, but on exposure to sunlight an explosion occurs and carbon is deposited. In diffused sunlight no explosion occurs, but the hydrogen atoms are displaced by equivalent quantities of chlorine, with the formation of substitution products; the most important is chloroform, CHCl_3 .

Methanol, see METHYL ALCOHOL.

Methglin, see under MEAD.

Methil, seaport of W. Fifeshire, Scotland, on the N. shore of the firth of Forth, and 1 m. S.W. of Leven. A new dock was opened in 1911, and M. has become one of the chief coal ports of the firth of Forth. Pop. 12,000.

Methley, tn. in Yorkshire, England, 7 m. S.E. of Leeds, with coal-mines. Pop. 5000.

Methodism (Gk. *μέθοδος*, rule), term applied to a religious organisation which owes its origin to John and Charles Wesley. The name 'Methodists' was given to certain Oxford students who, with the brothers Wesley, met together at fixed times to acquire regular habits of religious study and prayer. In 1735 the Wesley brothers took up missionary work in Georgia, with little success. In 1738 John Wesley experienced a spiritual transformation, from which resulted the whole of his evangelical work. He and his fellow evangelists were repudiated by the Church of England, and, not being able to preach in Anglican churches, they adopted the plan of preaching in the open air. After preaching Wesley encouraged his listeners to meet among themselves in his absence, and in 1740 a society under the control of John Wesley met habitually in a room in the Old Foundry near Moorgfields, London. He later drew up 'Rules of the Society,' which are still accepted by the Wesleyan Methodist Church. In 1741 Wesley declared his support of the Arminian doctrine, and the emphasis upon the communion of the individual with God without priestly intervention, and the universal hope of salvation, is the keynote of

M., along with its Presbyterian rather than episcopal organisation.

The chief characteristic of the church is the 'class-meeting.' Any one who feels a 'desire to flee from the wrath to come and be saved from his sins,' may become a member of a class-meeting, by which act he is enrolled as a member of the church. No one can be a member of the Methodist Church without having his name down on a 'class-book,' though attempts have been made to alter this rule. The classes meet weekly for the purposes of Christian fellowship under the guidance of a 'leader.' Each church has its stewards, whose duties are partly religious and partly financial. A circuit quarterly meeting is also held, formed of representatives from different churches or chapels in the neighbourhood, which together make up a 'circuit.' A minister is invited to a church by the quarterly meeting. Besides ordained 'travelling' ministers, there are 'local preachers.' These are laymen who offer voluntary services on Sunday, and after passing certain examinations are then enrolled as preachers. The whole connexion is governed by an ann. assembly, held in different tns. of the United Kingdom, known as the conference. Down to the year 1784 it was a select ministerial council, presided over by John Wesley. In that year its rights were defined, and it was given specific control over the ministers and churches throughout the connection. In 1787 lay representatives were introduced into conference, and in 1911 women were admitted under the same rules as laymen. It is an elected body of 650 members, half ministers and half laymen. The Methodist Church is governed primarily by the conference, secondarily by the synods (held in September and May), consisting of all the ministers and of selected laymen in each dist., over which a chairman is appointed by the conference; and thirdly by quarterly meetings of the ministers and lay officers of each circuit. The authority of both synods and quarterly meetings is subordinate to the conference, which has the supreme legislative and judicial power in M.

There are seven Brit. theological colleges for the training of ministers, at Richmond (Surrey), Didsbury, Houndsorth, Headingley, Cambridge, Belfast, and Manchester, and two schools for the children of Wesleyan ministers. Trinity Hall, Southport, for girls and Kingswood School, Bath, for boys. The National Children's Home and Orphanage is under the superintendence of the conference. The Methodist Book-room in City Road, London, issues a number of tracts and religious publications. The chief papers of the society are the *London Quarterly Review* and the *Methodist Magazine*. The *Methodist Recorder* is an independent publication.

In England there were many secessions from the Wesleyan Church, but in 1932 an amalgamation was effected of Wesleyan, Primitive, and United Methodists. The Methodist New Connexion was formed

in 1797 under the leadership of Alexander Kilham, who, in his pamphlet *The Progress of Liberty* (1795), asked for more power for laymen and less for the ministers. In 1907 this body amalgamated with the United Methodist Free Churches (estab. 1837) under the name of the United Methodist Church. The Protestant Methodists formed themselves into a separate body as a protest against placing an organ in the Brunswick Methodist Church, Leeds (1828). The Bible Christians or Bryanites found the restrictions of conference irksome in evangelistic work among the Cornish miners, and separated from the larger body in 1815. These two latter joined the United Methodists in 1907. Another secession took place in 1812, through the expulsion of Hugh Bourne and Wm. Clowes, who, in spite of the expressed wish of conference, persisted in holding open-air revival meetings. They consequently organised an independent church, called the Primitive Methodist Connexion, which held its first conference in 1820. The Wesleyan Reform Union (q.v.) still survives. The Welsh Calvinistic Methodists were founded by Whitefield independently of the Wesleyan Methodist movement in England. Their church gov. resembles that of the Presbyterian Church. The Methodist Episcopal Church of the U.S.A. originated in the evangelistic work of some Irish immigrants, who settled in New York in 1766. It received its first bishops in Francis Asbury and the Rev. Thomas Coke, who were ordained by John Wesley. The Amer., unlike the Eng., Methodist Church, has the episcopal form of gov. John Wesley ordained a few ministers in Scotland, and even in England, but he did not himself desire the separation from the Church of England, and his rule was that Methodist services were not to be held at the same time as those of the Anglican Church; this rule has since been abandoned.

The Methodist Protestant Connexion of America arose in 1844 on the question of more democratic gov. A further secession from the Methodist Episcopal Church took place in 1844 on the question of slavery when the Methodist Episcopal Church, South, was formed. There are some nineteen Methodist bodies in the U.S.A. The Methodist Episcopal Church has over 4,000,000 members. The Methodist Episcopal Church, South - a remainder of the cleavage in the country during the Civil war - has about 2,500,000 members. There are a number of churches composed of Negro citizens, the largest being the African Methodists with 446,000 members and the African Methodist Episcopal Zion Church with 457,000. The various Methodist societies of Canada united into one church in 1833. The various Methodist denominations in Australia, New Zealand, Tasmania, and the S. Seas united with the Wesleyans in 1900-2, forming one M. in the S. Pacific, while in Ireland and in Africa the various Methodist Societies have also united. In 1946 in association with the conference in Great Britain and Ireland (at home and abroad), there were 5403 ministers, 42,641 lay preachers,

1,233,542 members and probationers, 20,535 churches, 15,629 Sunday schools, 128,300 Sunday school officers and teachers and 948,415 Sunday scholars. The 1939 statistics of M. throughout the world were ministers, 54,340; local preachers, 83,263; members and probationers, 11,666,646; Sunday schools, 76,057; officers and teachers, 820,202; scholars, 7,495,834; churches and other preaching places, 91,175. See further under WESLEY, JOHN, and CHARLES; WHITEFIELD, GEORGE; and the bibliographies thereto.

See J. Wesley, *Journal*, 1739, and *Works*, 1771-74; A. Stevens, *History of the Religious Movement called Methodism*, 1861; G. Smith, *History of Methodism*, 1862; J. Rigg, *The Commercial Economy of Wesleyan Methodism*, 1879, and *Church Organisations*, 1897; Waller, *Constitution and Policy of Wesleyan Methodism*, 1880; J. Atkinson, *Centennial History of American Methodism*, 1884; S. M. Buckley, *History of Methodists in the U.S.*, 1895; Barclay, *Constitution of the Methodist Episcopal Church in America*, 1902; H. B. Kendall, *Origin and History of the Primitive Methodist Church*, 1906; J. S. Simon, *The Revival of Religion in England the Eighteenth Century*, 1907; J. Gregory, *History of Methodism*, 1911; B. Brasil, *Methodism*, 1928; J. S. Lidgeott, *Methodism in the Modern World*, 1929; S. G. Diamond, *Psychology of Methodism*, 1932; E. R. Taylor, *Methodism and Politics*, 1797-1851, 1935; H. Bett, *The Spirit of Methodism*, 1937; M. Edwards, *Methodism and England, 1856-1932*, 1943; B. Frost, *The Pattern of Methodism*, 1948; N. Sykes, *Wesley and the Methodist Movement*, 1950.

Methodius, see CYRIL and METHODIUS.
Method, Scientific, see SCIENTIFIC

METHOD.

Methuen, Paul Sanford, third Baron (1845-1932), Brit. field marshal, b. at Minehead, Somerset, succeeded Frederick Henry Paul M., the second baron (1818-1891). He was descended from the lord chancellor of Ireland, John M. (d. 1706). Educated at Eton, he joined the Scots Guards in 1864. He took part in the Ashanti war of 1874 and in the Egyptian war of 1882. He commanded 'Methuen's Horse' in the Bechuanaland expedition of 1884-85. During the Boer war of 1899-1902 he was in command of the 1st Div. of the First Army Corps. After defeating the Boers at Belmont, Emslie, and the Modder R., he was taken prisoner in 1902 by Delarey, but released. He was appointed commander-in-chief of the E. command in 1903, and was general officer commanding-in-chief of S. Africa, 1908-1912. From 1909 to 1915 he was governor of Natal, and from 1915 to 1919 of Malta. He was made field marshal in 1911 and governor of the Tower of London in 1920.

Methuen. The publishing house of M. was founded in 1889 by Algernon M. Marshall Stedman, afterwards Sir Algernon M., Bart. The nucleus of the new firm was formed by the founder's own school text-books, some of which are still standard educational works. From the

outset books by outstanding authors appeared in M.'s list, one of the first being S. Baring-Gould. In 1892 appeared the first vol. of Kipling's verse, *Barrack Room Ballads*, followed by other collections of his poetry, *The Seven Seas*, *The Five Nations*, *Departmental Ditties*, and *The Years Between*. Pub. of these and works by such authors as G. K. Chesterton and Arnold Bennett had given the firm a distinguished place in the publishing trade by the time of the founder's death in 1924. His place as chairman was taken by E. V. Lucas and the ever-growing list of famous authors later contained the names of Kenneth Grahame, W. W. Jacobs, and such present day favourites as A. P. Herbert, H. V. Morton, A. A. Milne, Pearl Buck, and Joan Grant. M.'s have always pub. a large number of scientific and academic works, and this policy is continuing at the present time. In 1939 the firm acquired the controlling interest in Chapman & Hall, publishers of Dickens's works.

Methuen, tn. of Essex co., Massachusetts, U.S.A., 2 m. N.N.W. of Lawrence. There are manufs. of textiles, shoes, etc. Pop. 15,000.

Methuen Treaty, commercial treaty arranged between England and Portugal in 1703. It was negotiated by Paul Methuen, son of John Methuen, chancellor of Ireland, and by it Portugal was to provide 28,000 troops for the war of the Sp. Succession, Britain to maintain half of them; Portuguese wines were received at a lower duty than those imported from France; and a similar advantage given to Eng. wool in Portugal. It was abandoned in 1836. The heavy consumption of port wine in England dates from the M. T.

Methuselah, according to Genesis, the son of Enoch and grandfather of Noah, of the family of Seth. He is the oldest man mentioned in the Bible, dying at the age of 969 years.

Methven, vil. in Perthshire, Scotland, 6 m. W.N.W. of Perth. The Eng. deolated Bruce here in 1306. Pop. 2000.

Methyl (CH_3), compound radicle, i.e. collection of atoms which can enter into the composition of a series of compounds and retain its identity. It functions in the role of a positive radicle, and in this respect has something in common with the positive radicle ammonium, NH_4^+ . It has no stable separate existence, though it can be isolated for a very brief period.

Methyl hydride or methane	CH_4H
Dimethyl or ethane	CH_3CH_3
Methyl chloride	CH_3Cl
Methyl alcohol	$\text{CH}_3(\text{OH})$
Methyl sulphate	$(\text{CH}_3)_2\text{SO}_4$
Methyl cyanide	CH_3CN
Methylamine	CH_3NH_2
Methyl acetate	$\text{CH}_3\text{COOCH}_3$
Dimethyl ether	$(\text{CH}_3)_2\text{O}$
Nitromethane	CH_3NO_2

Methyl Alcohol (CH_3OH), Methanol or Carbinal, the simplest of the monohydric alcohols, occurs in sev. natural substances, e.g. as methyl salicylate in oil of wintergreen. On distilling this oil with dilute

potash an aqueous solution of pure M. A. is obtained. It is chiefly prepared from the products of the destructive distillation of seasoned hard wood, such as oak, thorn, birch, and beech, from which the bark has been removed. The operation is performed in iron retorts at 200–260° C. The alcohol is obtained by redistilling the crude distillate over lime, finally purifying by the formation of the crystalline calcium chloride compound or of the oxalic ester, from which it is obtained by distillation with water or with potash. 100 parts of dry wood produce about 50 parts of 'pyrrolignous acid' containing 4 per cent of M. A., together with acetic acid, acetone, tar water, etc. M. A. is a colourless liquid (sp. gr. 0.814 at 20° C.); it boils at 64.7° C., and has a vinous odour and burning taste. It mixes with water in all proportions. When passed over a copper or nickel catalyst at 240° C. it decomposes into hydrogen and formaldehyde. This has important applications. It is largely used in the preparation of organic dyes and varnishes, and for the preparation of methylated spirit and perfumes.

Synthetic Methanol.—Methods have been perfected for the synthetic production of methanol. It had been known for some time that carbon monoxide could be made to combine with hydrogen, $\text{CO} + 2\text{H}_2 = \text{CH}_3\text{OH}$, with the aid of catalysts. Many of these have been investigated on the large scale, but the most efficient appears to be a mixture of zinc oxide and chromium sesquioxide obtained from basic zinc chromate. In presence of this water gas alone, or a mixture of hydrogen and carbon monoxide in the ratio $\text{CO} : \text{H}_2 = 1 : 2$, gives methanol at 350–400° C. under pressures of about 200 atmospheres. This is condensed and redistilled.

Methylaniline, colourless liquid, smelling like aniline; chemical formula, $\text{C}_6\text{H}_5\text{NHCH}_3$; sp. gr. 0.976 at 15°; boiling point, 192°. It is readily oxidised in air, when it becomes brownish in colour. It is obtained by heating aniline hydrochloride and methyl alcohol under pressure at 180°; the base is separated by adding an alkali and distilling in steam and, after separation, drying over caustic soda, and distilling. It can also be obtained by reducing methylene-aniline, $\text{C}_6\text{H}_5\text{NCH}_3$, by zinc and sodium hydroxide. M. has been used as a drug under the name 'exalgin.'

Methylated Spirit. In order to meet the large demand for alcohol destined to be used for purposes other than drinking, there are two alcohol mixtures which can be obtained duty free.

Mineralised Methylated Spirit.—This is obtained by mixing 9 volumes of ordinary 'plain' spirit (which shall be not less than 50° under proof, and is usually more) with 1 volume of wood naphtha or wood spirit, and a small amount of mineral naphtha. The last ingredient serves the purpose of making the liquid unfit to drink. Since 1918 colouring material in the form of methyl violet has also been included. Such a spirit contains methyl alcohol (7.7 per cent), ethyl alcohol (83 per

cent), water (19.21 per cent), as well as small amounts of acetone and other ketones, esters, unsaturated compounds, and substances of a basic nature. This spirit finds wide applications in everyday life. It gives a white opalescence when added to water. By law it may not be purified.

Industrial Methylated Spirit.—This is meant to meet the need for an alcohol which contains a higher percentage of ethyl alcohol, and which can be employed for the many industrial operations in which this compound is required, particularly as a solvent for varnishes, drugs, perfumes, etc. It contains 95 per cent of ethyl alcohol and 5 per cent of crude naphtha, without the addition of any mineral naphtha. There is no colouring material added and no turbidity is given when mixed with water. Numerous restrictions are placed on the proper use of this form of spirit. It can only be obtained direct from the methylators in quantities of 5 gallons or over, and it must not be used for drinking purposes, or left in any final product which can be taken internally.

Methyl Benzene, see TOLUENE.

Methyl-Butadiene, see ISOPRENE.

Methyl-Glycine, see SARCOMINE.

Methyl Methacrylate, see under PLASTICS.

Metis (*Mētis*), in Gk. mythology, was the personification of prudence. She was the daughter of Oceanus and Tethys and the first wife of Zeus, who, in fear lest she should give birth to a child more powerful than himself, devoured her in wrath. He afterwards blindly gave birth to Athene, who issued from his head.

Metius, Adrian (1571–1635), Dutch geometer, b. at Alkmaar. He found out a true relation of the circumference of a circle to its diameter, i.e. the value π , which had previously been represented by $\frac{22}{7}$. Among his works are *Doctrinae sphaericæ libri v.*; *Calendarium perpetuum* (1627); and *Praxis nova geometrica Problemata astronomica* (1665).

Metius, James, brother of Adrian, also a native of Alkmaar. He is said to have invented the refracting telescope in 1609, on the mere report of which invention Galileo constructed his first telescope the following year.

Metol, white, crystalline sulphate of para-methylanilinophenol $\text{C}_6\text{H}_4(\text{OH})\text{NHC}_6\text{H}_3$ made from monochloroacetic acid (1 molecule) and para-aminophenol (2 molecules). M. is used as a developer (see PHOTOGRAPHY), particularly for under-exposed plates. It darkens in light, and has the drawback of often producing skin trouble.

Meton (Gk. *Mētōn*) (fl. 432 B.C.), astronomer of anet, Athens. He is famous for having introduced the metonic cycle, a period of nineteen solar years and to determine eccles. feasts.

Metope (Gk. *μετόπη*, a middle space), term in architecture for that part of the front which is interposed between two triglyphs in a Doric frieze.

Metre, in poetry, is that arrangement of syllables in an orderly succession so as to constitute verse. The syllables are

divided into a number of similar or dissimilar groups, each of which constitutes a line or verse (Gk. *στίχον*), and in modern languages the end syllables of these lines are often related by rhyme or assonance. The lines themselves can be subdivided into feet, each line normally consisting of a certain number of these feet regularly repeated. In Gk. and Lat. verse M. consisted in a regular succession of long and short syllables, and the verse accent did not usually coincide with the ordinary accent of the word. In Eng., however, quantity has ceased to be definite and definable, and it is upon the accent that M. depends. It is, therefore, with the alternation of accented and unaccented syllables that the laws of M. deal.

In Eng. each foot is supposed to consist of an accented syllable combined with either one or two unaccented syllables. In this way five kinds of measure are secured: (1) The commonest of feet is the *iambus*, consisting of one unaccented and one accented, such as the word *estate*. (2) The *trochee*, one accented and one unaccented, as *holy*. (3) The *dactyl* (Gk. δάκτυλος, a finger, from its three joints), consisting of an accented syllable followed by two unaccented, as in *happiness*. (4) The *anapest* (through *a*, *e*, *k*), the dactyl reversed, as in *prudence*. (5) The *amphibrach*, an accented syllable between two unaccented, as in *appearance*. These different feet may be arranged so as to form various kinds of lines. Theoretically each line should consist of a certain number of similar feet, but in practice there is not often this regularity. Freedom in the use of syllabic equivalents makes the verse supple instead of stiff, and its value was clearly understood by so early a poet as Chaucer. The doctrine of 'syllabic equivalents' is, briefly, that two unaccented syllables are equivalent to one accented. Hence in spite of the conventional demand for an accented syllable in each foot, many a one in reality consists only of three unaccented syllables. This great freedom, which is characteristic of the best Eng. verse, makes it difficult and wellnigh impossible to measure this verse by rule of thumb. Much of it could be scanned in many ways, and could be brought within the bounds of no limited system.

It is possible, however, to speak of certain types of verse, and to show the normal construction to which all the variants are related. Perhaps the best known verse is the *iambic pentameter*, known as the *heroic couplet* when each pair of lines is connected by rhyme, and as *blank verse* when unrhymed. The elegiac is also a decasyllabic measure, but here the rhymes are alternate and the verse is generally divided into stanzas of four lines (e.g. Gray's *Elegy*). *Rhyme royal*, used by Chaucer in sev. of his minor poems, is written in stanzas of seven iambic pentameter lines rhyming *a b a b b c*. *Octosyllabics*, consisting generally of four iambic feet, are useful for quicker narrative, and were commonly used by Scott and Byron for this purpose. The M. usually known as *ballad metre*, also very common in

hymn tunes of quatrains, consists of lines of eight and six syllables alternately. Anapæsts and trochees are frequently substituted for iambs, the latter being especially used at the beginning of a line. See J. B. Mayor, *Chapters on English Metre*, 1886; G. E. Saintsbury, *Historical Manual of English Prosody*, 1906-9; W. E. Leonard, *The Scansion of Middle English Alliterative Verse*, 1920; Elsie Foord, *The Speaking of English Verse*, 1923; T. Taig, *Rhythm and Metre*, 1929; and S. O. Andrew, *The Old English Alliterative Measure*, 1931.

Metric System. This system of weights and measures was introduced by the Fr. Republic in 1801. Its fundamental unit of length is the metre, which was taken as one ten-millionth part of the distance from the poles to the equator. Recent investigation has shown that this is inaccurate, and the standard is now defined as the length of a bar of an alloy of iridium and platinum kept in the archives in Paris. It is by far the most practical system. Its various units for larger and smaller distances than the metre being multiples and sub-multiples of ten of the metre. Thus to convert metres into decimetres it is only necessary to multiply by ten. It is a legal system in Great Britain by Act of Parliament (1864), although the Act has remained practically inoperative. The system is universally used in scientific investigation.

Measures of Length.—1 kilometre = 1000 metres; 1 metre = 100 centimetres = 1000 millimetres. The Brit. equivalent for 1 metre = 39.37 in. Therefore 1 centimetre = 0.3937 in.

Measures of Area.—As in the Eng. system the term square foot is used, so in the M. S. there is a square metre, and the following denominations are commonly used: 100 square millimetres = 1 square centimetre; 10,000 square centimetres = 1 square metre; 1 square kilometre = 1,000,000 square metres. The Brit. equivalents are 1 square metre = 1.196 square yards; 1 square kilometre = 0.386 square miles. The denominations 1 hectare = 10,000 square metres, 1 acre = 100 square metres are occasionally used.

Measures of Volume.—1 litre = 1000 cubic centimetres = 1.76 pints; various multiples and submultiples of the litre being also used.

Measures of Mass.—1000 milligrammes = 1 grammie; 1000 grammes = 1 kilogramme; 1 grammie = 15.4 grains; 1 kilogramme = 2.205 lb. The various measures are connected by the relation that 1 cubic centimetre of water at temp. 4° C. weighs 1 grammie, or that 1 litre, i.e. 1 cubic decimetre or 1000 cubic centimetres, weighs 1 kilogramme.

Metronome, instrument used for determining and securing the movement of musical compositions. It was invented by Maelzel about 1814, and consists essentially of a pendulum of which the point of suspension is between the extremities. The pendulum is driven by a spring and wheel which ticks the oscillations. A movable weight is attached to the pendulum and an upright scale graduated to

correspond with marks on the rod is placed behind. The period of the pendulum's vibration can thus be varied to any required time by adjusting the weight until it is opposite one of these lines, the mark near the line giving the number of oscillations per minute.

Metropolitan Opera House, New York, U.S.A., was first built on 39th Street in 1883. Ten years later it was burned down and the present building replacing it was opened in 1893. The M. O. H. has a seating capacity of 3418. It is famous for the high standard of its productions, and an appearance there is a prize coveted by the greatest singers from all over the world. See R. R. Wilson, *New York, 1909*, and W. F. Bonnet, *New York, the World's Metropolis, 1629-1924*, 1924.

Metropolitan Police. The M. P. came into being, as the result of Peel's Police Bill of 1829, in the form of the 'New Police' experiment of that year. After a

are the authority for regulating the street traffic, and they issue and licences to proprietors, drivers, and conductors of conveyances enabling omnibuses, carriages, taxis, etc., to ply or stand for hire within the M. P. dist.; and they have power to make by-laws for regulating the conduct of all such persons. The M. P. are the only force for which the home secretary is responsible to Parliament, but the city of London is policed separately by force of about 1100 men organised and controlled by the common council of the city (Metropolitan Police Acts, 1829 and 1830). The authorised estab. of the M. P. on Dec. 31, 1948, was 18,335, exclusive of C.I.D., 1404, and women police, 338. The actual strength on that date was uniform branch, 14,152, C.I.D. full strength, and women 223. The force is administered by a commissioner, with a deputy commissioner and four assistant commissioners, and a number of other officials constituting the M. P. office at New Scotland Yard, London, S.W. In a memorandum (issued as a White Paper on May 11, 1935) the gov. accepted in principle Lord Trenchard's (then commissioner) proposal to reorganise the M. P., chiefly by recruiting young men to the higher posts by a system of competitive selection. A M. P. college was instituted at Hendon shortly before the Second World War, but criticism of Lord Trenchard's scheme, both in theory and practice, led to its abandonment, and the college was not reopened after the war. A new police college for members of all police forces was opened at Ryton-on-Dunsmore, Warwickshire, in Oct. 1948. See also METROPOLITAN POLICE COURTS.

Metropolitan Police Courts. petty sessional courts presided over by paid professional magistracy, generally called stipendiaries. Other large tns. have such courts as distinct from those of the unpaid magistracy, but the police court (in the sense in which it is used in this article) originated in London in the early Georgian period when the previous tentative efforts to police Westminster were developed by the appointment of constables, and 'annoyance juries,' who reported on public nuisances, annoyances, and other small offences. In 1792 the Crown was given power to establish seven public courts in specified metropolitan pars., and to appoint three justices drawn from the Middlesex and Surrey magistracy for each of such courts. The Act of 1792 was repealed and re-enacted by an Act passed in 1802, and this later Act may be regarded as the real charter of the metropolitan stipendiaries. The seven courts or 'public offices,' as they were styled, were estab. at the pars. of St. Margaret, Westminster; St. James, Westminster; St. James, Clerkenwell; St. Leonard, Shoreditch; St. Mary, Whitechapel; and St. Paul, Shadwell (for Middlesex), and at or near St. Margaret's Hill, Southwark (for Surrey). The result of this estab. of paid magistrates in the metropolis was that they enjoyed a monopoly of fees at their public offices within the limits of the Weekly Bills of Mortality, for henceforth,



John H. Stone
SCOTLAND YARD

period of struggle for existence in the face of fierce popular hostility, they succeeded in securing public approval and respect, and they were in general outline the model on which all the prov. forces were allowed to develop. The area under the supervision of the M. P. includes the whole of the administrative co. of London, which comprises its twenty-eight boro., and it includes also the whole of the administrative co. of Middlesex and parts of the cos. of Surrey, Kent, Essex, and Hertfordshire (roughly speaking, the area within a fifteen-mile radius of Charing Cross). Like other police their primary duties are the prevention and detection of crime and the preservation of order. They

with few exceptions, no fees could be taken by any other justices under a penalty of £100. The excepted cases were, *inter alia*, fees for licensing alehouses, and fees for the purpose of enforcing the payment of taxes and assessments arising within the par. concerned, and generally fees taken at Bow Street Public Office, this celebrated place being thus early a central institution. Notwithstanding these changes, the policing of the metropolis left much to be desired, especially in the vicinity of the Thames. The 'hooliganism' in the neighbourhood of the riv. resulted in the estab. of a police office at Wapping New Stairs with three justices and seven constables. Altogether in 1797 there were not above 2000 constables or 'watchmen' in the metropolis. Accordingly, in 1830, another court was estab. at Westminster, and the 'metropolitan police dist.' constituted, the component pars. of which were henceforth to be policed by the new 'police force,' who were placed under the direct control of the justices, and superseded the old London watchmen. A later Act extended the jurisdiction of the M. P. C. by giving the police constables of the metropolitan force powers in Buckinghamshire and Berkshire, in addition to the metropolitan area prop.^{erly} so called. The M. P. C. now number fourteen: Bow Street with three magistrates, Clerkenwell two, Greenwich and Woolwich two between them, Lambeth two, Marylebone two, Thames two, Tower Bridge one, N. London two, Old Street two, W. London two, Great Marlborough Street two, S.W. two, and W. Ham one. Juvenile courts were estab. by order in council of Dec. 2, 1909, at Bow Street, Clerkenwell, Tower Bridge, Westminster, Old Street, and Greenwich. Children's courts in separate buildings from police courts have been constituted by orders in council; they are held at Caxton Hall, Westminster; Stamford House, Goldhawk Road, W.; Toynbee Hall, Commercial Street, E.; Lambeth Tn. Hall, Brixton Hill, S.W.; Morley College, Westminster Bridge Road, S.E.; Chelsea Juvenile Court, Lennox Gardens, S.W.; Friends House, Euston Road, N.W.

The Crown is empowered under the Metropolitan Police Courts Act, 1839, to alter the number of the courts and magistrates, and under an Act of 1840 to constitute police court divs., with a police court for each, provided only the number of the magistrates does not at any time exceed twenty-seven. Courts are held every day, Sundays and holidays excepted. The salary of the chief magistrate is now £2300, that of each of the others being £2000. Bow Street has the distinction of being the only court having jurisdiction in extradition cases. Everything which can be said to relate to public order or the prevention of nuisances comes within the general jurisdiction of the M. P. C.; serious crimes are rousted to the London sessions or criminal sessions at the Central Criminal Court.

Metropolitan Water Board, body responsible for the water supply to the administrative co. of London, a duty which

was formerly left to the initiative of the various metropolitan water companies. The board, as constituted by the provisions of the Metropolis Water Act, 1902, is composed of sixty-six members, fourteen of whom are appointed by the London Co. Council, two by the common council of the city, two by the city council of the bor. of Westminster, one by each of the remaining metropolitan bor. councils and the remainder by the local authorities of those dists. which, though outside the co. of London, are included within the metropolitan water area. Its supply services cover an area of 575 sq. m., comprising a pop. of 7,549,000 inhab. The ann. supply in 1940-41 was 110,000,000,000 gallons (representing 491,300,000 tons), being a daily average of 300,69 million gallons. The chief sources of supply are the Thames and Lee Rrs., and another source is the New Riv. Company's undertaking, which famous scheme was inaugurated in 1605 by Sir Hugh Myddleton to bring water from Amwell and Chadwell to Hertfordshire, to London. The largest reservoirs are near Staines. The board's charges are levied on rateable value at such rate, not exceeding 8*l* per cent, as the board may fix. The capital debt of the board is about £56,660,000 (1940), and the net water rental approximately £5,336,000 (1910).

Metrotrhagia, see under MENSTRUATION.

Matsu, or **Metzu**, Gabriel (1630-67). Dutch painter, b. at Leyden. He studied under Gerard Dow, and in 1648 was admitted into the Painters' Guild at Leyden, but left that city two years later for Amsterdam, where he is titled as a painter of genre pictures. His chief works are 'The Market-place of Amsterdam,' at the Louvre; 'The Sportsman,' at The Hague; 'The Game-dealer's Shop,' at Dresden; 'The Repast,' at the Hermitage, Leningrad; and 'The Duet' and 'The Music Lesson' in the National Gallery, London. See R. H. Wilenski, *Introduction to Dutch Art*, 1927.

Metternich-Winneburg, Clemens Wenzel Nepomuk Lothar, Duke of Portella, and later Prince von Metternich (1773-1859). Austrian statesman, b. at Koblenz, his father being Franz Georg Karl von M.-W. also a statesman. In 1795 he married the daughter of Prince Kaunitz, and henceforward assumed a prominent position in the diplomatic world. He became minister at Dresden in 1801, and two years later was transferred to Berlin. During the years 1806-7 he represented Austria at Paris, where, in spite of his anti-Napoleonic policy, he managed to keep on good terms with Napoleon, whom he tried to bring into an alliance with Austria. The war which followed was terminated by Napoleon's victory at Wagram and the treaty of Vienna (1809). After this M. became chancellor and foreign minister. For some time he veiled his enmity against Napoleon, and succeeded in negotiating the marriage betw. on that emperor and Maria Louise in 1810. But during the next two years the attitude and the successes of Napoleon led to the formation of the great alliance between Russia, Austria,

and Prussia, in which, by acute diplomacy, M. secured for Austria the leading position (Töplitz, 1813). The victory of Leipzig enabled him to dictate terms to Napoleon, and he took a leading part in the negotiations which followed this event.

From this date M. figures as the champion of Conservatism throughout Europe. By his diplomacy he again managed to secure the leading position in the Holy Alliance, which he used as an instrument for furthering these aims. The revolution of 1848 came as a great shock to him, and its results were seen in Austria in the fall of his gov. He left Austria with an armed escort and took refuge in England. In 1851 he removed to his castle of Johannishurg on the Rhine. He d. at Vienna in 1859.

In the search by M., Castlereagh, and the Tsar Alexander I. for a European order, M. was the real protagonist, and for a generation he was the mainstay of a federal Europe which at least preserved a species of European peace. It was in the search for a more constructive cure for the revolutionary malady than mere suppression that M. and his contemporaries encountered difficulties, and M. was clear-sighted enough to see that his system of securing co-operation against revolution must sooner or later fail before the fundamental dilemmas of his policy. Perhaps he was the last of the eighteenth-century benevolent despots. He was never a Liberal. In the last resort he was unalterably opposed to popular sovereignty, yet too cynical and even too humane to believe in mere blind repression. Towards the end of his life he said: 'The people let themselves be duped easily enough; you cannot exaggerate the goodness of the people, I might even say of all peoples; but their ignorance is as great; therefore they must be led.' He believed in a philosophy of equilibrium, both in relation to the classes and powers within a state and to the interrelations of the European powers. Since both had been disturbed by the Fr. Revolution and Napoleon, M. conceived it essential to restore the balance and to maintain it. In that he realised that paternal gov. must justify itself by its wisdom, popularity, and efficiency, M. was a reformer. He advanced schemes for the strengthening of the council of state, and for rallying popular support by reviving prov. sentiment. But he was the servant of an autocrat who disliked change, and nothing came of his reforms; and, as with so many of the great men of hist., his reputation sank to its lowest point in the generation following his death. His memoirs were pub. at Vienna (1878-84), and were trans. into Eng. in 1880. See A. Beer, *Zehn Jahre österreichischer Politik, 1801-10, 1877, etc.*; A. Sorel, *L'Europe et la révolution française, 1848*; and E. L. Woodward, *Three Studies in European Conservatism, 1929*. See also P. Quennell (ed., with biographical foreword), *The Private Letters of Princess Lieven to Prince Metternich, 1820-26, 1948*, and life by A. Cecil, 1956.

Mettmann, tn. in the Rhineland, Germany, about 8 m. N.E. of Düsseldorf.

In the vicinity the Neander Cave, containing the remains of a prehistoric human being, the Neanderthal Man (see NEANDERTHAL), was discovered. Pop. 11,000.

Mettur Dam, in Madras, the essential part of the Cauvery-M. system of irrigation. It was inaugurated on Aug. 21, 1934, and the project was framed with two main objects: to improve the existing fluctuating water supplies for the Cauvery R. delta irrigation of over 1,000,000 ac., and to extend irrigation to a new area of 300,000 ac. The construction of the dam itself was undertaken to store the flood waters of the riv. and to pass them down to the delta as and when required. The construction of the dam increases the potentiality of the M. dist. as an industrial centre, and that dist. now has the advantages of cheap power, an ample supply of water, and proximity to cotton and ground-nut tracts.

Metz, tn. and fortress, formerly of Germany, in Alsace-Lorraine, now the chief tn. of the Fr. dept. of Moselle, 33 m. N. of Nancy. It is situated on the Moselle at its confluence with the Seille, and is surrounded by a system of fortifications. Its streets are wide and clean, and it contains numerous spacious squares. The cathedral, a Gothic edifice, was begun in 1014 and finished in 1546. The church of Notre-Dame-de-la-Ronde is a noteworthy structure with a choir built in 1130. In the cemetery of Chambière there is a memorial to the 8400 Frenchmen who fell in the war of 1870. Its industry is active, the chief employments being lace-making, tanning, and embroidering, and there is trade in corn, poultry, fruit, and wine; there are also brass and copper foundries.

M., known to the Romans, by the name of Divodurum, was the chief tn. of a people called the Mediomatrii, whose name it took at a later date. In the fifth century the corrupted form Mettis first came into use, whence the modern M. It surrendered to the Gers. in 1870. It was restored to France with Lorraine in Nov. 1918, when all the streets were renamed. It was entered by the Fr. troops under Gen. Petain on Nov. 19, 1918. M. once again changed hands when France collapsed in 1940, and remained in Ger. possession for 4 yrs. By Sept. 11, 1944, the Allies had estab. themselves in strength on the E. bank of the Moselle between M. and Nancy. In the M. area Patton's (g.v.) Third Army forces had captured Aumetz on that date, and driven to Thionville, 12 m. N. of M. by the 13th. The city itself, however, was stubbornly defended, and the siege was long and arduous. On the Third Army's front Nancy fell on Sept. 15, but M. strongly defended by its outer ring of forts, held out until the allied offensive ultimately reduced the great stronghold on Nov. 22. Pop. 83,000. See further under WESTERN FRONT IN SECOND WORLD WAR.

Metzingen, tn. in Württemberg-Baden, Germany, on the R. Neckar, 18 m. S.S.E. of Stuttgart. Pop. 7000.

Metztitlan, tn. of Mexico in the state of Hidalgo, 40 m. N. of Pachuca. Pop. 8000.

Metzu, Gabriel, *see METSU*.

Méudon, tn. and S.W. suburb of Paris, France, in the dept. of Seine-et-Oise. It manufactures glass, ammunition, and linen goods. There is one of the eight observatories outside Paris. Pop. 20,800.

Meulebeke, industrial tn. near Courtrai, Belgium, in the prov. of W. Flanders, with manufacturers of lace and textiles, and bleaching works. Pop. 9200.

Meulen, Adam François van der (1632-1690), Flem. painter, b. in Brussels. He was a pupil of Peter Snayers, but soon surpassed his master. Colbert appointed him battle-painter to Louis XIV. He painted the prin. battles and sieges in Flanders for the château of Marly. In 1673 he was made a member of the academy. Many of his pictures are at the Louvre and Versailles.

Meun, genus of umbelliferous plants. *M. adiananthum* is the Spignel, Men, or Baldmoneys of Scotland. The leaves are bipinnate, with crowded, bristle-like segments, and the umbels of flowers are yellow.

Meung, Jean de (*Jean Clopinet*) (c. 1250-1305), Fr. satirist, lived in Paris. He wrote over 20,000 lines in continuation of Guillaume de Lorris's *Roman de la rose*, the style, logical expositio, and virility of which entitle him to be called the first of Fr. medieval poets. In his contempt for romance, superstition, feudalism, monasticism, the papacy, and royalty, he was, moreover, the Voltaire of his age.

Meunier, Constantin (1831-1905), Belgian sculptor and painter, b. near Brussels. Among his best known pictures are 'The Salle St. Roch' (1857); 'A Trappist Funeral' (1860); and the notable series depicting the miners and factory hands in Lemonnier's *Le Tour du monde*. But it is primarily as a sculptor he will live. His best statues are 'Miner'; 'Puddler' (1885); and 'Mower' (1892); and a series of bas-reliefs which he called a 'Monument to Labour'. *See* Lives by G. Treu, 1898, and C. Lemonnier, 1903.

Meurice, François Paul (1818-1905). Fr. dramatist, studied law and literature, was made chief editor of Victor Hugo's *Éducateur*, and imprisoned as such for six months. In 1878 he dramatised *Les Misérables*, and afterwards *Notre Dame de Paris* and *Quatre-vingt-treize*. Two of his original plays were *Bourgeois Cellini* (1852) and *Suzanne* (1893); whilst for *Falstaff* (1842) and *Hamlet* (1843) he had collaborators.

Meursius, Johannes (properly Jan de Meurs) (1579-1639). Dutch classical scholar, became prof. of hist. and afterwards of Gk. at Leyden Univ. (1610 and 1611), and in 1625 accepted the chair of hist. at Sorø in Denmark, as the execution of Barneveldt, whose children he taught, had exposed him to ceaseless persecutions. Among many other works, he wrote *Res Belgicae* (1612); a *Glossarium Græco-Barbarum* (1614); and *Historia Danica* (1630). *See also* J. Gronovius, *Thesaurus Graecarum Antiquitatum*, 1697-1702.

Meurthe et Moselle, dept. in the N.E. of France, being formed, after the treaty

with Germany in 1871, out of the remnants of the old depts. of Meurthe and Moselle. It consists of the four arrons, of Nancy, Briey, Lunéville, and Toul. The prov. is drained by the Moselle, an affluent of the Rhine, and its trib., and by the Chiers, a trib. of the Meuse. Grand Rougimont (2041 ft.) in the Vosges is the highest peak. The Paris-Strasburg main line passes through Nancy, the cap. The manufs. of cast and sheet iron, of iron and steel goods, and of earthenware and glass are very considerable. Rock-salt is found in abundance. Viticulture flourishes, and cereals, potatoes, and hops are widely grown. Area 2036 sq. m. Pop. 528,800.

Meuse: 1. Dept. of N.E. France, composed of portions of Lorraine and Champagne. It consists of the three arrons. of Bar-le-Duc, Commercy, and Verdun. The basin of the Meuse, which flows N. from E. to W., occupies one-half of the dept., the rest being drained in the N.E. by the Orne and Chiers and other streams. The main ridge of highlands, which sink from S. northwards, forms the watershed between the Seine and Rhine. The hills of the Argonne are clothed with magnificent oak forests. Cereals, potatoes, and mangold-wurzels are the staple agric. products, and the vine is profitably cultivated. Freestone is quarried, but neither the mineral wealth nor the industries are important. Cap., Bar-le-Duc. Area 2408 sq. m. Pop. 188,700. 2. Or Maas, riv. over 550 m. long, rising in the dept. of Haute-Marne, France. Passing Verdun and Sedan in a northerly direction it enters Belgium, and after bending eastward beyond Namur, flows northward again past Liège in Belgium and Maastricht in Holland. After a sharp curve westward it enters the Waal, that is the left arm of the Rhine, at Woudrichem. It now divides the N. branch, called the Merwede, proceeding to Dordrecht, whence it eventually reaches the sea through two channels, the Oude and the Nieuwe-Maas, and the S. which, after entering the Hollandsche Diep, flows into the sea through the Haringvliet and Krammer. Rotterdam and Dianant are both on its banks. Its main affluents are the Sambre, the Ourthe, the Geer, and the Roer. For the military operations in the dept. and in the M. valley in the First World War, *see FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGNS IN; WORLD WAR, FIRST*, under various sub-headings relating to the W. front. The M. to the S. of Namur, was part of the main line of defence of Belgium, in the Second World War, stretching N. over Wavre and Koningshook to Antwerp. The crossing of the M. was forced in the sector defended by the Fr. Ninth Army at Houx, 4 m. N. of Dianant on May 13. For the operations of the First and Third Amer. Armies on the M. around Namur, Dianant, and Commercy, and St. Michiel, in Sept. 1944; for details of von Rundstedt's Ardennes counter offensive (Dec. 17, 1944) and plan to break through the Allies' thin line of defences in a sudden blitz drive to the M. in the Liège-Namur area; and for the operations in Holland at Nijmegen and

Arnhem over the M. in the autumn of 1944, see WESTERN FRONT IN SECOND WORLD WAR.

Meuselwitz, manufacturing tn. in Thuringia, Germany, 8 m. N.W. of Altenburg. Pop. 10,000.

Meux, Sir Hedworth, see LAMPTON.

Mevagissey, pilchard fishing station and health resort, 12 m. E. of Truro, Cornwall, England. Pop. 3,500.

Mevis, see NEVIS.

Mewès, Charles Frédéric (1858-1914), Fr. architect, by birth a Fr. Alsacian, his ancestors being emigrants from the Baltic provs. who settled in Strasbourg. He studied under Pascal (q.v.) at the Ecole des Beaux Arts, where he won several distinctions. His design of the Palais de Congrès for the exhibition of 1900 gained him the Legion of Honour. He was the first to create a style of architecture and decoration which was generally adopted for hotels all over the world. His contribution to the architectural development of the London of the early twentieth century was noteworthy and it is by that work that his name will be chiefly remembered, as he produced relatively little in his own country. His most significant building in France was the Paris Ritz, entrusted to him by Cesar Ritz, the famous *hôtelier*, whose name has passed into the language. Situated in the Place Vendôme, this small exclusive hotel became the model for all subsequent buildings of its type and the standard by which the design and equipment of a modern high-class hotel was judged. Soon after the Paris Ritz was opened in 1900 M. came to London to take charge of the interior planning of the new Carlton Hotel in Pall Mall, built from the designs of the Eng. architect Henry Florence. M. and his partner, Arthur Davis, revised the plans and completed the building, with its central palm court. He and Davis were then invited to design the Ritz in Piccadilly and in this they were the pioneers of many innovations. They also designed the old *Morning Post* offices at the junction of the Strand and Aldwych; the club-house of the Royal Automobile Club, which embodies some of M.'s ideas in his earlier hydropathic estab. at Contrexéville, and many tn. and country houses, such as Luton Hoo in England and sev. fine houses in Cologne and Hamburg. M. was an exponent of logical and practical planning on axial lines, with strong feelings for style and proportion, eminently suitable for luxury hotels, clubs, private residences, and, later, for the interiors of mammoth liners, among these latter the *Imperator* (*Bremen*) in which he collaborated with his Swiss partner, Bischoff.

Mexborough, tn. with potteries and iron and glass works, on the Don, 5½ m. N.E. by N. of Rotherham in the W. Riding of Yorkshire, England. There are coal-mines near by. Pop. 17,900.

Mexia, Pedro (1496-1552), Sp. historian, was appointed historiographer to the Emperor Charles V. in 1548. In his *Historia Imperial y Cesarea* (1547) he chronicled the reigns of all the Roman emperors from Julius Caesar to the

Austrian Maximilian. His chief work is *Silva de Varia Lección* (1543).

Mexican and Central American Native Languages. Unlike N. America (see under NORTH AMERICAN NATIVE LANGUAGES), in Mexico and a great part of Central and S. America (see SOUTH AMERICAN NATIVE LANGUAGES) the native pop. still flourishes. Of the seventeen republics of Lat. America, only three (Costa Rica, Argentina, and Uruguay) are mainly white, nine (Mexico, Salvador, Honduras, Nicaragua, Panama, Venezuela, Colombia, Chile, and Paraguay) are mainly *mestizo*, i.e. of mixed descent, four are mainly Indian (Guatemala, Ecuador, Peru, and Bolivia), and the vast republic of Brazil is about half white.

The native language of Mexico is Aztec, a Nahuatl language, i.e. belonging to the Nithou linguistic family. It is spoken by some 650,000 people in N. and central Mexico. The great state of Oaxaca in S. Mexico offers the most complex linguistic situation existing in that country. There are a large number of tribal and linguistic groups, speaking about fifty different languages, which differ greatly in culture. Nowadays, however, the most important native languages are Mixtec, and, especially, Zapotec, which is spoken by sev. thousand people in S. Oaxaca; a Zapotec dialect, called Villa Alta, is spoken in N.E. Oaxaca.

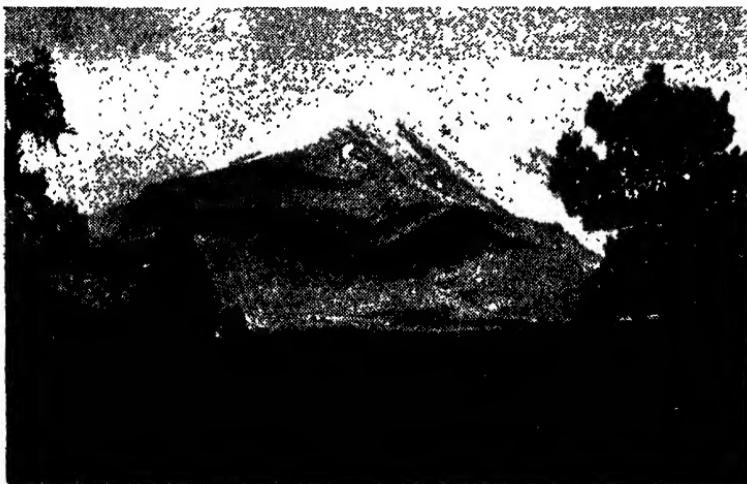
The Mayas, one of the most important and most civilised peoples of native America, still form the bulk of the pop. of Yucatan. They may be divided into three main groups, speaking allied languages: (1) the Mayas proper, subdivided into many tribes speaking various dialects, and numbering about 300,000, in Yucatan, and the neighbouring states of Mexico and Guatemala; (2) the Quiche (some 40,000), between Lake Atitlan and the Pacific, S. Guatemala; and (3) the Huasteca (about 50,000) in Vera Cruz, Hidalgo, Tamaulipas, and San Luis Potosí, already separated from the main stock in ancient times. See also under LINGUISTIC FAMILIES. See LANGUAGES (CLASSIFICATION OF); NORTH AMERICAN NATIVE LANGUAGES; SOUTH AMERICAN NATIVE LANGUAGES.

Mexico (Estados Unidos Mexicanos), republic in the N. of the Amer. sub-continent, occupying the S. extension of the continent towards Central America. It is bounded N. by the U.S.A. and S.E. by Brit. Honduras and Guatemala, and has a coast-line of over 1,500 m. on the Atlantic gulf of M. and of over 2,000 m. on the Pacific side. Its area is 760,175 sq. m., and pop. (1946) 22,776,000.

Physical Features.—The elevation upon which M. lies is formed by the mt. range of the Sierra Madre (the Mexican name for the Sierra Nevada) which runs parallel with the E. coast, and which, like the Rockies, is prolonged from the N. into M., the two ranges eventually converging in the narrow Isthmus of Tehuantepec and uniting to form the Nudo Mixteco or Mixteco Knot. There are steep slopes from this plateau both to the Pacific and the Atlantic or gulf of M. The plateau

between the ranges is known as the plateau of Anahuac, which is broken up into many deep and broad valleys, and surrounded by the peaks of mts., the ridges of which form its surface; it is the region of the anc. Mexican civilisation. This tableland or plateau (of some 270,200 sq. m.) gradually expands in breadth northwards, and remains on an average elevation of about 6000 ft as far as 420 m. from the city of M., after which it gradually declines. In the W. is the long peninsula of California, with a mountainous surface separated from the Mexican mainland by the gulf of Lower California. The Sierra Madre ends in a series of volcanic peaks from Colima

Norte flows from Ciudad Juarez, in the state of Chihuahua, to Matamoros in the state of Tamaulipas. It rises S. of the tn. of Las Cruces in the state of Texas and its course in M. (976 m.) is one of calm and shallow waters reaching great widths in certain places. Its Mexican trib. are the Conchos and San Juan Rs., besides other streams that considerably augment its volume and enhance its value for irrigation purposes. The largest freshwater lakes are Chapala (70 m. long by 20 wide), Patzcuaro, and Xochimilco. In the N.W. in an arid region are saline lakes. All the littorals, especially those of the Caribbean Sea, Pacific, and gulf of California (also called gulf of Cortez), are



Mexican Embassy

CITLALTEPETL, OR PICO DE ORIZABA MEXICO (18,344 FT.)

(12,800 ft.) on the W. to Citlaltepetl, or Pico de Orizaba (18,311 ft.) on the E. Other peaks are Popocatepetl (17,866 ft.), Ixtaccihuatl (17,114 ft.), and others of considerable altitude, whose summits are covered with perpetual snows. The low-lying lands of the coast are tropical regions below 3000 ft. in altitude; the temperate regions are at an altitude from 3000 to 6000 ft. and the height of the plateau forms the cold region over 6000 ft. The only rvs. of note are the Rio Grande del Norte or Bravo, which forms part of the N. boundary and is navigable for over 60 m. from its mouth in the gulf of M., and the Rio Grande de Santiago, which flows from Lake Chapala to the Pacific Ocean. The remaining streams—Lerma and Balsas, both emptying in the Pacific; Pameo, Papaloapan, and the Coatzacoalcos flowing into the gulf of M.; and the Usumacinta and Grijalva further S. at the commencement of the Yucatan peninsula—run in mt. torrents between the deep canyons or *barrancas*. The Rio Grande del

dotted with a number of small ls., of a total area of about 1931 sq. m. Those in the Caribbean are Mujeres (it was here that the Spaniards first set foot on Mexican ter.) and Cautoy, off the extreme N.E. corner of Yucatan. In the gulf of M. the largest are Carmen and Puerto Real. In the gulf of California are Angel de la Guarda and Tiburon, and, to the S. off the coast of the peninsula, are the ls. of El Carmen, San José, Espíritu Santo, and Cerralvo. Maria, Madre, María Magdalena, and María Clefas ls. (commonly known as Islas Marías) lie off the port of San Blas in the state of Nayarit. W. of the port of Manzanillo is the archipelago of Revillagigedo, formed by the ls. of Roca Partida, San Benedicto, and Socorro. Guadalupe, San Benito, Cedros, and Santo Tomás lie off the S.W. coast of the peninsula of Lower California.

Climate.—M. is divided almost equally by the tropic of Cancer so that the S. half lies in the torrid and the N. half in the temperate zone. From this position M.

should have a hot and uniform climate somewhat cooler in the N., but the altitude and other factors modify such general uniformity and give rise to a considerable variety. The warmer region is S. of the tropic of Cancer, especially in the lowlands up to an elevation of 2600-2900 ft., and here the hottest dist. is the Balsas Valley, the S. part of Yucatan and the coastal zone of Tehuantepec having an average ann. temp. of 28° C. The temperate regions extending N. and S. of the tropic of Cancer along the mtn. ranges and the central plateau enjoy a mild climate all the year round. The cold zone is that of the mtn. and sierras over 9000 ft. up to 14,000 ft. Only the snowy summits of the highest peaks exceed these altitudes and so correspond to the glacial climates. The coastal regions, especially those of the Isthmus of Tehuantepec and the gulf of M., have the same high temps. and abundant rainfall and belong to the hot and damp type of climate. The Central Plateau enjoys a mild climate throughout its extent. The rainfall of M. varies, but is regular in its seasons. In 15 per cent of the country it rains less than thirty days in the year; in 38 per cent from thirty to sixty days; in 28 per cent sixty to ninety days; and in the remaining nineteen per cent the rainy season is still longer. As a whole the ann. rainfall is estimated at 15 $\frac{1}{2}$ in. for 30 per cent of the country, 15 $\frac{1}{2}$ to 31 $\frac{1}{2}$ in. for 35 per cent; and of over 31 $\frac{1}{2}$ in. for the remaining 35 per cent.

Races.—The pop. of M. includes the aborigines or Indian races, the white, the mestizos or mixed races, and sev. other groups from various nations. The white race penetrated into M. with the arrival of the Spaniards. During the Sp. colonial period the immigration of subjects of other European countries was prohibited, so that non-Sp. immigrants were few. The mestizos, who represent about 52 per cent of the total pop., are the descendants of the inter-marriage of European colonisers and natives. Ethnologists have studied the distinctive characteristics of each group of the pure Indian races and subdivide them into families: the Nahoa family, extending from the state of Sinaloa to Tabasco, include numerous tribes, e.g. the Mexicans of the federal dist., the Cholultecas of Puebla and the Tuxtecos of Vera Cruz. The great Mayaquech family occupies Yucatan and the E. isthmian portion of Tabasco and Chiapas. The Mixtecas and Zapotecas are confined to Oaxaca, and with them dwell other aboriginal groups, such as the Chananteos of the Papaloapan region. The Tarasca family occupies the Tarasco-Nahua region corresponding to the state of Michoacan, and stretches N. through the extensive table-lands beyond the Lerma R. The Otomes and their branches inhabit the states of M., Hidalgo, Puebla, Queretaro, Guanajuato, San Luis Potosi and Tamaulipas. The Tamaulipacos, Coahuiltecos, and Tobosos form the Atapascana family, and the Opatas and Pimas the Pimana or Sonorense family. The name of N.

Nahoas is assigned to the Yaqui and Mayo tribes, as well as to others of the W. Sierra Madre. Descendants of the Zoques, Chiapas, and others still inhabit the Isthmian region.

Fauna and Flora.—M. breeds all kinds of domestic animals, and aviculture, cattle-raising, apiculture, and sericulture are widely carried on. Fur-bearing animals are scarce, but foxes, otters, and skunks are to be found. There are no dangerous animals, except the rare species of the tigrillo and wild cat. Rabbits and hares are abundant, as also are quail and dove, all these being so much sought as to necessitate restrictive regulations. The flora of the *Tierra caliente* is most striking; Mexican vanilla is famous. Mexican flowers enjoy wide admiration: bougainvillea, camellias, orchids, gardenias, and magnolias in the tropical regions; roses, carnations, and pansies in the temperate cline; and violets, rhododendrons, and dahlias in the cold regions.

Agriculture, Minerals, and Manufactures.—M. imports large quantities of food, although the country is potentially a rich agric. area. There are vast tracts of virgin soil on the central plateau and in the tropical areas, and millions of ac. which have been only superficially worked by the primitive farming methods of the peasants could produce a far higher yield with the aid of modern agric. science and machinery. Systematic irrigation is in its infancy; over 17,000,000 ac. of arable land were farmed in 1946, but only about 12 per cent of this was irrigated. By law the *ejido* is the unit for communal land-holding. Up to Sept. 1, 1945, 65,000,000 ac. had been confiscated by the state and redistributed to over 2,000,000 families. Alienation of the land in the *ejido* is not possible, since the state holds the title to it on behalf of the *ejido*. Stock-raising, agriculture, and mining are the chief occupations. The prin. agric. crops are maize, wheat, barley, beans, Chile pepper, coffee, cotton, sugar, tobacco, vanilla, and all kinds of tropical fruit. Other products are chick-peas and chicle-gum. The maguey or Mexican aloe is cultivated for the beverage known as 'pulque,' and other species of this plant yield sisal-hemp or henequen and pitiflax. Half of the world's supply of sisal is grown in Yucatan. The Mexican forests abound in mahogany, ebony, rose-wood, and caoutchouc trees, large-scale cultivation of rubber being undertaken under supervision by Amer. experts in 1941. There are great numbers of livestock, including 10,000,000 cattle, 1,000,000 sheep, 2,000,000 horses, 7,000,000 goats, and 5,000,000 pigs. M. is potentially the leading silver-producing country in the world, and could meet a demand of 200,000,000 oz. a year. Output to-day is about 40 per cent of world production, but has declined from 86,000,000 fine oz. in 1943 to 61,000,000 oz. in 1946. Other minerals produced are gold, iron, copper, manganese, magnesite, lead, zinc, mercury, and antimony. M. is the fourth largest petroleum producer in the world. Her reserves were estimated at 9,000,000

barrels in 1947. The output of petroleum in 1946 exceeded 49,000,000 barrels; of this, rather less than 20 per cent was exported, the U.S.A. being the biggest single customer. On March 18, 1938, the three large companies which controlled most of the oilfields were nationalised by decree. In 1942 M. agreed to pay the U.S.A. \$24,000,000 compensation for Amer. property confiscated, and five years later promised compensation of \$81,250,000 to former Brit. and Dutch owners of oil properties. The oil-fields employ about 22,200 men and have a refining capacity of 200,000 barrels a day. There are nearly 900 producing oil wells and a dozen refineries. M. is predominantly rural, with, consequently, few industries apart from agriculture and mining and therefore large tns. are not numerous. But, though M. is not a manufacturing country, there was a considerable development of manufacturing industries between the two world wars. There are some fifty tobacco factories, 1000 textile factories, and some hundreds of timber mills, metal factories, chemical plants, and food-making plants. In all, according to the 1945 census, there were 28,513 factories, employing 512,400 workers.

Trade.—The trade of M. in 1946 was valued at 2,636,737,000 pesos for imports and 1,915,261,000 pesos for exports. Exports included mainly precious metals, coffee, chicle, and oil. Of the total exports over 70 per cent went to the U.S.A. The chief imports are usually wheat and sugar, but in 1946 these came next in order after trucks and motor-cars. Of total imports 83·4 per cent came from the U.S.A., nearly 2 per cent from Britain, 3 per cent from Argentina. From S. and Central America as a whole imports were 7·7 per cent of the total and from the Brit. Empire 3·8 per cent. M.'s heavy adverse balance with the U.S.A. reflects the flow of investments resulting in the reconstruction of Mexican mining, transportation, and manufacturing industries.

Communications.—There are thirty-nine ocean ports, the chief being Vera Cruz and Tampico, both on the gulf of M. Total shipping under the Mexican flag (as at 1940) was 10,368 vessels of 1,658,000 gross tons. There are three railroad lines connecting the centre of the republic with the U.S.A., these being the National Railways, the S. Pacific Railroad, and the Mexican Railway. Two lines run from M. city to Vera Cruz. Another line extends S. to the Guatemalan border, and there are numerous branch lines joining these main arteries. The total railway system exceeds 15,000 m. There are paved highways from Laredo city to M. city, from M. city to Acapulco, Vera Cruz, Guadalajara and Morelia, Oaxaca, Puebla, Tehuacan, Queretaro, Tampico, Tuxpan, Tolosa, and Cuauhtla. Many new automobile roads have been opened in recent years and many others are still under construction. Fourteen air lines operate in M., whose routes represent a total length of 112,000 m. of airways.

Constitution.—The constitution of 1917,

amending that of 1857, has itself been amended sev. times between 1929 and 1946. M. is a federal republic, comprising twenty-eight states, each autonomous in local affairs. Congress consists of a chamber of 147 deputies, elected for three years by universal suffrage, and a senate of fifty-eight members, two for each state and the federal dist., elected for six years. The president, who is elected for six years, is chosen by direct popular vote at a general election. The president and a council of the heads of depts., and the secretaries of the ministries direct the administration. The seat of the republican legislature, executive, and judiciary is M. city. The judicial power is vested in the supreme court, consisting of twenty-one judges, and also in the dist. attorneys and circuit magistrates. In 1938 women were given equal citizenship and suffrage with men, subject to ratification of this constitutional amendment by two-thirds of the states. The constitution divides the functions of the legislature, executive, and judicial depts. of gov. in a similar manner to that estab. by the constitutions of other Amer. countries and provides the basis on which regulative legislation respecting labour, social services, etc., must be dictated.

M. consists of the following states: Aguascalientes (cap. Aguascalientes), 2499 sq. m., pop. 161,700; Campeche (Campeche), 19,670 sq. m., 90,500; Chiapas (Tuxtla Gutiérrez) 28,700 sq. m., 679,800; Chihuahua (Chihuahua), 94,800 sq. m., 624,000; Coahuila (Saltillo) 58,000 sq. m., 550,700; Colima (Colima) 2000 sq. m., 78,800; Durango (Durango) 42,270 sq. m., 483,800; Guanajuato (Guanajuato) 11,800 sq. m., 1,046,500; Guerrero (Chilpancingo) 21,885 sq. m., 733,000; Hidalgo (Pachuca) 8037 sq. m., 771,800; Jalisco (Guadalajara) 31,149 sq. m., 1,418,300; M. state (Toluca) 8267 sq. m., 1,146,000; Michoacán (Morelia) 23,200 sq. m., 1,182,000; Morelos (Cuernavaca) 1916 sq. m., 182,700; Nayarit (Tepic) 10,144 sq. m., 216,700; Nuevo León (Monterrey) 25,134 sq. m., 541,100; Oaxaca (Oaxaca) 36,371 sq. m., 1,193,000; Puebla (Puebla) 13,124 sq. m., 1,294,600; Queretaro (Querétaro) 4432 sq. m., 215,000; San Luis Potosí (San Luis Potosí) 24,415 sq. m., 679,000; Sinaloa (Culiacán) 22,580 sq. m., 493,000; Sonora (Hermosillo) 70,477 sq. m., 364,200; Tabasco (Villa Hermosa) 9782 sq. m., 285,600; Tamaulipas (Ciudad Victoria) 30,731 sq. m., 459,000; Tlaxcala (Tlaxcala) 1,555 sq. m., 224,000; Vera Cruz (Jalapa) 27,736 sq. m., 1,019,300; Yucatan (Merida) 23,926 sq. m., 418,200; and Zacatecas (Zacatecas) 28,120 sq. m., 565,400. There are also three ter., N. and S. Lower California and Quintana Roo; the federal is., comprising the ls. around M., which are inhabited; and the federal dist. (ter. acquired from M. state by the Mexican Gov. for its especial use, comprising M. city and a small area around it). Each state has its own constitution, taxes, and laws; and a governor, legislature, and judicial officers popularly elected. All states must publish and enforce the

federal laws. The governors of the N. and S. ters. of Lower California, of Quintana Roo, and of the federal dist. are appointed by the president of the republic. The judicial power of these ters. is exercised by judges nominated by the supreme court of justice. They have representatives in the federal Congress but have no legislative power.

Education and Religion.—There is, in theory, compulsory free primary education until the age of fifteen, but the census taken in 1940 showed that 54·1 per cent of the pop. over ten years of age was illiterate, and this percentage was doubled in the federal dist. In 1946 there were 69,880 estabs. for the education of illiterate adult civilians, while the army had over 150 regimental schools for the instruction of its illiterates. In the federal dist. and in the ters. the national gov. supervises education, but elsewhere it is the concern of state authorities. Boys are compelled to do military drill. The eleven univs. possess a large measure of independence. The National Univ. at M. city (founded 1553) is the most important, and admits women; since 1910 it has been practically autonomous. In 1945 it had over 22,000 students. A time lapse of a generation should show a considerable reduction in the number of illiterates, for there are many modern training colleges for primary and secondary teachers, and many vil. schools have been built during the past thirty years. A fine building, often the best in the vil., is found among the peasants' hovels. It is the focus of new ideas, and the schoolmaster is generally the leader of progressive activities. The 21,000 primary schools have nearly 2,000,000 pupils; 45,000 children attend the secondary schools. Entire reform of agric. education was foreshadowed in a law pub. in July 1946. There are twenty-nine industrial and commercial schools, with 14,000 pupils.

The pop. is predominantly Rom. Catholic. Prior to M. attaining independence (*see further under History*) the Catholic Church had immense power in the state, and owned half the property in the country. The bitter anti-clericalism of Mexican Govs. in the nineteenth and twentieth centuries represented the reaction against this situation. The constitution of 1857 completely severed Church from State, and the constitution in force in 1949 was in effect extremely anti-clerical. It strictly confined and regulated the Catholic confession and all others, although the open persecution of the priesthood which was waged by the Calles Gov. (1924–28) had ceased. In 1947 there were about 350 authorised priests; but some latitude was allowed to churches which stood completely aloof from secular affairs, and in 1946–37 many states allowed Catholic churches to reopen. Some religious instruction could again be given to children. But Church property has been considered the possession of the state since 1917, and eccles. bodies forbidden to acquire property in land.

Language.—Sp. is the official language, but the native language is Aztec, belonging to the Nahua linguistic family. In Yucatán natives speak the Maya tongue, but they are as a rule familiar with Sp. (*see MEXICAN AND CENTRAL AMERICAN NATIVE LANGUAGES*). The Maya civilisation dates from an earlier epoch than the Aztec culture and Maya is an aboriginal idiom. Its origin is prior to the Nahua immigration or source of the various primitive branches such as Tolteca, Chichimeca, Tlaxcalteca, Azteca, etc.

Currency and Finance.—M. informed the International Monetary Fund in 1946 that the unit of account was the peso, valued at 20.5973 cents (U.S.), or 0·183042 gramme of fine gold. The peso was pegged at 4·85 to the dollar at the end of 1941, but was later freed. The old Sp. measures are still used, although the metrical weights and measures system was officially enforced in 1928.

The estimated revenue (budget) in 1948 was 2,050,000,000 pesos and expenditure, 2,300,000,000 pesos. National debt (Dec. 31, 1947) was as follows: Consolidated, 1,482,700,000 pesos; floating, 195,800,000 pesos; and external debt, 230,630,000 pesos.

Chief Cities with Population at the 1940 Census.—M. city, 1,448,100; Guadalajara, 236,600; Monterrey, 190,100; Puebla, 148,700; Mérida, 115,200; Aguascalientes, 104,300; León, 103,300; Toluca, 98,000; San Luis Potosí, 97,800; Culiacán, 93,300; Torreón, 87,800; Tampico, 84,000; Chihuahua, 78,800; Morelia, 77,600; Vera Cruz, 75,800; Saltillo, 75,700; Querétaro, 73,000; Mazatlán, 63,300; Durango, 62,200; Centro, 62,000; Irapuato, 60,600; Pachuca, 59,400; Ciudad Juaréz, 56,000; Jalapa, 46,800.

Population.—Estimated pop., Dec. 31, 1946, was 22,776,000, an increase of 15·8 per cent since 1940.

History.—In the absence of all definite evidence, and in the face of an unparalleled dearth of contemporary MSS., it is impossible to fix, with any degree of certainty, the earlier events in Mexican hist. We know that about the seventh century of the Christian era the Nahua nations began to settle in the valley of M., and a leading tribe, the Toltecs (probably meaning artificers), founded a city named Tollan on the site of the present vil. of Tula, about 30 m. N.W. of M. city. This kingdom long flourished and was a centre of civilisation. This archaic civilisation, in the eleventh century, fell before the assaults of another Nahua tribe, the Chichimecs, and these adopted the arts and culture of the race they had overthrown. The various subdv. of this family founded cities throughout a tract of ter. commensurate with modern M. Of them the Aztecs were the chief, and they founded the city of Anahuac or M., and at the time of the Sp. conquest they had attained a widespread suzerainty. On the coming of the Spaniards under Cortez in 1519, Aztec rule was finally overthrown, chiefly by means of the assistance the Spaniards received from the peoples who had been subjugated by

the Aztecs. After the disgrace of Cortez M. was governed by a viceroy and council for nearly three hundred years.

In 1821, after a prolonged revolutionary campaign, the independence of M. was secured, and an emperor, Augustin de Iturbide, seated on the throne. He abdicated in 1823, but, attempting to return, was shot in the following year. M. was proclaimed a republic in 1824. In 1846 there was war with the U.S.A., which ended in the defeat of M. New M. and Upper California were ceded to the conquerors, who, however, paid compensation of \$15,000,000. In 1863, through the intervention of Napoleon III. of France, the unfortunate Maximilian, an Austrian archduke, was created emperor of M. His reign was brief, and despite President Porfirio Diaz obtained control Fr. assistance he was deposed and executed. After a long period of anarchy, of affairs. He did far more to bring the republic into line with other civilised communities than any of his predecessors. After a long and prosperous term of office a series of revolutionary movements destroyed his power and in 1911 he was forced to fly the country. His successor was Madero, but complete anarchy had set in, and in 1913 he was murdered. The next president was Gen. Huerta, who seemed likely to restore order and began to rule with a strong hand. However, he incurred the hostility of the U.S.A., who favoured his rival Carranza, and in 1914 he was forced to fly; thus the last prospect of order in M. vanished. Carranza managed to hold power for some six stormy years, but in 1920 he was assassinated. Obregon and Calles, who were the next presidents, effected some improvements, and order and prosperity began to return, but Obregon, on the eve of his second term as president, was assassinated in 1928. Calles, who was president from 1924 to 1928, carried out various reforms, but his administration was marked by a bitter struggle between Church and State. Up to this time the constitutional provisions curtailing religious liberties had been almost wholly otiose. The Mexican Catholic episcopate chose this time to attack these provisions, being encouraged thereto by an apostolic letter of Pope Pius XI, expressing sympathy with the Mexican clergy on account of the 'wicked . . . regulations and laws' against 'the Catholic citizens of Mexico.' Calles, however, refused to modify the law, and churches or church property which had not then been nationalised were taken in control by gov. agents, though the churches were kept open for worship. The gov. offered to transfer the custody of the churches to the clergy if the latter agreed to recognise the law. This led to outbreaks, which were suppressed, and many members of the episcopate were deported (1927) (see further under *Religion and Education*). There was an abortive revolution in the early spring of 1930, when many army units mutinied under the leadership of Gen. Aguirre. Calles was then invited to become war minister to cope with the rebels. The U.S. Gov.

greatly assisted the federal gov. by announcing that they would continue to pursue a policy of extending moral and material aid to the latter and continue the 1924 embargo on munitions. The Amer. Gov. also sent supplies of rifles and small arms ammunition and bombs to the federal gov., and the further announcement that they would not recognise the rebels as belligerents had of necessity the effect that the latter were unable to borrow on the Amer. market or declare a blockade or forfeit contraband. Sev. severe engagements followed, notably the battle of Reforma, near Jiminez, but the revolt was short-lived, and after the capture and execution of Aguirre the revolt collapsed. The remainder of the year saw peaceful conditions under the administration of President Portes Gil, who succeeded Calles, the latter having been driven into exile in the U.S.A. (1936). In the ensuing elections, which were conducted without disturbance, either during the campaign or at the polls, Paschal Ortiz Rubio, a candidate of the so-called Revolutionary party, was elected by an enormous majority, polling over 1,800,000 votes, or practically 100 per cent of the votes cast, but he soon resigned and was succeeded in 1934 by Gen. Cardenas.

Relations between Church and State are strained and there is in M. no true religious liberty. Recently an arrangement was concluded between the national bishops and the gov. office-holders through whose acquiescence the Church was allowed to restore public worship and, to some extent, administer to the spiritual welfare of her children in M.

A question which agitated M. for five years (1937-41) was that of the ownership and control of the oil resources. In 1937 President Cardenas promulgated a decree which aimed at bringing all these resources under national control. Power was vested in the president to transfer to the National Petroleum Corporation leases to foreign countries as they expired. In a dispute between the foreign oil companies and their employees the federal board made an award maulching the companies in nearly £2,000,000 and, as the latter made no attempt to carry out the award, the gov. declared their property expropriated. The companies, sceptical of the Mexian offer of indemnification, appealed to their respective gov's. Meanwhile one result of taking over the oil-fields was that the gov., eschewing its democratic ideology, contracted to supply both Germany and Italy with oil. These attacks on foreign capital reacted unfavourably on the country's economic condition and created unrest among the propertied classes, and there was a short-lived revolt in 1938 under Gen. Cedillo, a guerrilla leader. In 1940 Cardenas was asked by the U.S. Gov. to submit the oil dispute to arbitration. By now the gov., in view of the heavy decrease in petroleum exports in consequence of the war, decided to reduce expenses by reorganising the industry in such a way as to involve restrictions on labour. But in view of the

country's sympathy for the Allies' cause this did not jeopardise the gov.'s prospects at the election (1940) and Gen. Camacho, the nominee of Cardenas, was elected by an overwhelming majority. The oil question was eventually settled in 1941 on the basis of expert valuations and a cash deposit by the Mexican Gov. of \$9,000,000; and, at the same time, the gov. agreed to pay \$40,000,000 in settlement of the long-standing general and agrarian claims by Amer. citizens.

M. is to-day preponderantly a democratic nation, and in 1936 Calles, who had then been almost a dictator for eleven years, was expelled for opposing the gov.'s efforts to set up a dictatorship on the Soviet model. The democratic sympathies were shown during the Sp. civil war, when M. exported considerable supplies of arms and ammunition to the Sp. Gov. The Carranzo Gov. fully realised the danger to M. implicit in the aggressive designs of the Axis powers and therefore readily responded to the various proposals made by the U.S.A. in 1941 for closer co-operation and settlement of outstanding differences. For its part, the gov. took prompt measures for the improvement of ports, the expansion of air bases, and the increase of the army. A trade agreement was concluded with the U.S.A. which provided for the purchase by the U.S.A. of all M.'s surplus products and the export by M. of certain materials only to the U.S.A. or to Latin-American nations which exercised export control, thus depriving Japan of one valuable source of supply of metals and minerals. The murder in M. in 1940 of Leon Trotsky, who had been granted an asylum there some years previously, involved the gov. in difficulties with the Communists, who were assumed to be responsible for the outrage. But the incident was soon forgotten in the world's greater tragedy, and by the end of 1941 M. had broken off relations with the Axis' states and the country prepared for war, Gen. Cardenas being appointed commander-in-chief. M. completed central Amer. solidarity by a formal declaration of war on June 2, 1942, as a response to Axis sinkings of Mexican ships. Relations with Britain, severed in 1938 during the oil expropriation dispute, were resumed but nothing was done to settle the Brit. claims. Up to the autumn of 1943 M.'s contribution to the war was wholly represented by the supply of strategic materials, but President Camacho in an address to Congress (Sept.) stated that, if necessary, M. was ready to take a more direct part. More than 11,000 Mexicans were then already enlisted in the Amer. forces. On Jan. 27, 1945, the final report of the Mexican-Amer. commission for economic co-operation was issued: it dealt with industrial development, agriculture, aviation, highway transport, and tourism. In the same month, in Congress, Camacho pledged M. to continued collaboration with the United Nations. It was on the initiative of M. that a conference of foreign ministers of all the member states (excepting Argentina) of the Pan-Amer.

Union was opened at M. city (Feb. 1945). The succeeding year was marked by the drawing closer of the ties of friendship with the U.S.A. In March 1947 President Truman paid a visit of goodwill to M. city and emphasised America's adherence to the principles laid down by F. Roosevelt regarding relations with the other Amer. republics. President Miguel Alemán—who was elected president by popular vote on July 7, 1946, and assumed office on Dec. 1 of that year—paid a return visit to Washington (April 1947), where he addressed the Amer. Congress. During the Second World War M. had been in the favoured position of selling in a world market which would absorb all its production. But with the end of the war her trade balances became adverse, draining the country of dollar credits. In 1946 inflationary conditions, bad in all Lat.-Amer. countries, compelled the gov. to prohibit the importation of luxury goods and to raise the duties on semi-luxury articles. President Alemán began his term of office with a programme of sound economic reforms combined with one or two references to social security. It was in this year that formal agreements were reached for the settlement of the Brit. and Dutch oil expropriation claims. These claims for \$250,000,000 were scaled to \$21,225,000. Also, a final payment of \$4,085,327 was made to U.S. firms, bringing the total U.S. payment to \$29,137,700. In Nov. 1947 M. city was en *séjour* for the general conference of Unesco (q.v.).

Archaeological Research.—The ancient monuments and other traces of their life and art executed by the aborigines give a high estimation of the degree of civilisation to which they had attained. In many parts of the country, especially at Cholula, Papantla, Tula, and Xochicalco, are found graduated pyramids known as Teocalli, or 'Houses of the Gods,' constructed of mounds of earth faced with masonry, in some instances elaborately carved. The fearful rite of human sacrifice was common; some authorities consider that 20,000 victims were destroyed annually in the cap. alone. On the summit of these pyramids the sacrifices took place to the god Tezcatlipoca, 'the soul of the world,' or to Huitzilopochtli, the god of war, or to Tlaloc, the rain god. Few traces of domestic architecture remain.

The form of gov. was elective monarchy, which was almost absolute, though the king was expected to confer with his council before deciding upon any important step. There was a well-defined code of laws, and the standard of morals was high. Wars were frequent, and the arms and armour of the Aztecs, though inadequate to oppose the Spaniards, were elaborate. The Mexican rank and file wore no armour; the chiefs had quilted cotton tunics and some reinforced them by thin plates of gold or silver. Their missile weapons were slings, bows and arrows, and javelins, pointed with bone or copper. Their warfare with the Spaniards resembled that of the Persians against the Gks. Prisoners-of-war were usually reserved for sacrifice.

The Aztecs were highly cultured, and, besides possessing a rudimentary system of picture writing, they were extraordinarily gifted in the pictile and minor graphic arts, and especially in feather work, of which the garments of the upper classes principally consisted. Prescott remarks that the Aztecs and the Incas far surpassed all other races on the Amer. continents in civilisation. The Mexican civilisation, though inferior to that of Peru in political capacity and most of the arts, was sufficiently imposing, and its ruthless destruction was a loss to the world. As will be seen in the article *MAYAS*, archaeologists have, in recent years, shown great interest in Mayan culture, more especially in Brit. Honduras. In M., however, the U.S. Gov. has assisted research work to considerable effect. Notable stone carvings have been found at Tchayauca, a site which has, in the opinion of experts, been continuously occupied since the Archaic period.

Art and Culture.—Not only did the Aztecs produce a massive, well-proportioned architectural style, the remains of which still survive. They also cut many delicate miniature figures from crystal and jade, and showed a high degree of skill in fashioning copper and gold ornaments. Their craftsmanship is at its finest in the sacred masks used in religious celebrations; many of these are extant, and are encrusted with elaborate and fanciful patterns of pearls, turquoise, and other jewels, in which a feather motif predominates. The Aztecs' unusual and effective colour combinations are still favoured by the Mexican peasant. The Sp. conquerors introduced renaissance and baroque styles. But Sp.-Mexican architecture shows marked signs of Mexican-Indian influence, even at the time when every effort was being made to eradicate all traces of the Indian civilisation. This is particularly noticeable in church architecture; baroque is often simply a basis on to which Indian masons and artists have moulded their traditional patterns. Churches are frequently decorated with multicoloured, polished glass, wood, or stone ornamentation; beaten metalwork is worked in Indian designs. Examples of this fusion in M. city include the churches of St. Fernando and St. Francisco, and the facade of the cathedral. Prov. architecture bears still stronger traces of Indian style, as at Puebla and Morelia. Both Sp. and Indian strains in art survive to-day, together with an abundant oral literature of myth and legend, which is being consciously invoked by modern Mexican artists in their determination to create a truly Mexican culture, while at the same time absorbing the artistic influences of Europe and N. America. (For Literature see SPANISH-AMERICAN LITERATURE.)

See W. H. Prescott, *History of the Conquest of Mexico*, 1843; F. Martin, *Mexico of the Twentieth Century*, 1907; C. R. Enoch, *Mexico*, 1910; H. Baerlein, *Mexico the Land of Unrest*, 1911; H. H. Bancroft, *History of Mexico*, 1883-88, 1914; N. O. Winter, *Mexico and her People* (Boston),

1923; H. J. Priestley, *The Mexican Nation: a History* (New York), 1923; J. F. Rippy, *The United States and Mexico*, 1926; J. E. Thompson, *Mexico before Cortez*, 1933; G. B. Camargo and K. G. Grubb, *Religion in the Republic of Mexico*, 1935; S. J. Parsons, *Mexican Martyrdom* (discusses the conflict between Church and State), 1937; E. N. Simpson, *The Ejido: Mexico's Way out*, 1937; P. Kelemin, *Mexico's Cultural History*, 1937; H. B. Parkes, *History of Mexico*, 1939; R. Gallop, *Mexican Mosaic*, 1939; J. B. Trend, *Mexico*, 1941; E. P. Hansen, *Mexico and Central America*, 1943; L. B. Simpson, *Many Mexicans*, 1946; M. Covarrubias, *Mexico South*, 1948; N. L. Whetten, *Rural Mexico*, 1948; F. Dobie, *Tongues of the Monte*, 1949.

Mexico, state of the republic of M., with Guerrero and Morelos to the S., and Hidalgo to the N. The federal dist. is an enclave in the state. Popocatepetl volcano is in the mts. which comprise the central and S.E. dists. Gold and silver mining and stockbreeding are carried on; tobacco, coffee, sugar, and cereals are grown; and there are manufs. of glass, pottery, and textiles. Cap. Toluca. Area 8267 sq. m. Pop. 1,146,000.

Mexico City, cap. of the United States of Mexico. It is the chief Lnt.-Amer. cap. after Buenos Aires in point of pop., and far superior in historical associations. It is 16 m. in circumference, covers 15 sq. m., and is situated in a fine valley, the valley of M., on the Anahuac plateau, well above sea level, at the S. extremity of the Mesa tableland and near the former lake of Texcoco. Its high elevation (7350 ft.) ensures an equable climate. The range of temp. is 20-85° F. with 58° as a mean; the nights are always cool; normal ann. rainfall is 26 in. No other city in the new world is richer in historical tradition or romantic lore. It was the heart of the Aztec culture, and on its broad plaza stands the great Teocalli or sacrificial pyramid, Tenochtitlan, the veritable Mecca of M. When Cortes first saw M. it was built on an is. in a large lake, with causeways to the shores. The lake has been reduced by drainage and dessication, and much of the new city has spread over the dried bed. After the conquest the city became the cap. of 'New Spain' and the seat of viceroys, and, even though the rule of Iturbide, its first national emperor, was short, the city could boast of being the cap. of the third largest empire of the world, ranking only after China and Russia. The greatest names in its hist. are those of Juarez, the lawyer-president, Hidalgo, the priest liberator, and Morelos, another champion of popular liberties. Generally speaking, the city is spacious and pleasing. The plaza, or zocalo, is over 300 yds. long and is overlooked by the splendid cathedral whose two towers rise to over 200 ft. and are a conspicuous landmark. The cathedral (the foundations of which were laid in 1573 and the whole building completed in 1811) stands upon the site of the Teocalli; it is 400 ft. long by 200 ft. wide, and is in the form of a Gk. cross; it has twenty-two side chapels,

an altar of marble columns, a balustrade with sixty-two statues, a giant candelabrum of precious metals, and some twenty Doric columns support the vaulted roof, while rich carvings and gildings and some rare paintings adorn the walls. This cathedral is probably the finest ecclesiastical building on the Amer. continent. The city is laid out with geometric exactness; the streets are wide and handsome, though the chief business thoroughfare, the Plateros, is narrow. This street is, however, lined with many magnificent shops. Near the plaza is the Palacio Nacional, containing the gov. dep'ts.; the museum observatory; the senate, and other im-

buildings are the post office, E. of the National Theatre, and the Palace of Fine Arts Theatre—the domes of the halls and theatre proper are lavishly ornamented with coloured stone. From the city the Paseo de la Reforma, a broad boulevard, extends in a S.-westerly direction for some 3 m. to the castle of Chapultepec, one of the residences of the presidents. The older suburbs, or residential centres, are Tacubaya, San Angel, Tlalpan, all quaint and attractive. On account of marshy subsoil interlacing steel rafts provide the foundation for many buildings in the city.

The city is a general clearing-house for



E.N.A

MEXICO CITY

Plaza de la Constitución, cathedral, and the adjoining Sagrario; left, the Calle Monte de Piedad

portant institutions. Over the portals of the Palacio hangs the 'liberty bell' of Hidalgo, which is rung by the president at midnight on the anniversary of Mexican independence. The present Palacio replaces another which was destroyed in 1689. It was built in 1691, but the top floor was added by President Calles. The museum contains among other interesting objects the Calendar Stone, assigned to Toltec culture, and the Sacrificial Stone which was found in the ruins of the great Teocalli. Among other important buildings are the national library, containing 1,250,000 books; the Mineria or school of mining engineering (one of the oldest buildings); the new legislative house, palace of justice, univ., and the Monte de Piedad or state pawnshop (this latter founded in 1775). A beautiful example of Churrigueresque architecture survives in La Merced Monastery, in the N. quarter of Merced Market. Two notable modern

the transit trade of the country, but its industries, which include the manuf. of tobacco and saddlery, are on a small scale. It is well supplied with water by means of two aqueducts. Although the climate is dry, healthy, and temperate, M. C. has hitherto had a reputation for unhealthiness, owing to unsatisfactory sanitary conditions, which, however, are now being improved. The death-rate is about 50 per 1000. From M. the snow-covered peaks of the volcanoes Popocatépetl and Ixtaccíhuatl can be clearly distinguished. M. C. has been termed the 'Paris of America'; it is cosmopolitan in character. Pop. (1940) 1,148,400, (estimated 1949) 1,651,800.

Mexico, Gulf of, great inlet situated between U.S.A. on the N. and M. on the W. and S. It has an area of some 800,000 sq. m., and is entered by the Gulf Stream, which sweeps its shores in a semicircle. It is subject to sudden wind-storms.

Meyer, Felix (1653–1713), Swiss painter, became famous by executing a series of frescoes for the abbey of St. Florian (Upper Austria). Deficient in the art of figure drawing, he excelled in portraying the beauties of his native landscape.

Meyer, Hans (1858–1929), Ger. explorer, b. at Hildburghausen. He was director of the Bibliographisches Institut, 1883–1914. After exploring Ger. E. Africa he ascended Kilimangiaro; in 1889 reached the summit of Kibo and found the crater, and studied the volcanoes and glaciation of Ecuadorian Cordilleras in 1903. In 1911 he made another long expedition in E. Africa. From 1915 to 1928 he was prof. of colonial geography and colonial politics in the univ. of Leipzig. His explorations are recorded in *Eine Weltreise* (1884); *Zum Schneedom des Kilimanjaro* (1888); *Ostafrikanische Gleisfahrt* (1890); *Gegenwart und Zukunft der deutschen Kolonien* (1916); *In Tälern und Höhen des Himalaja* (1926); and *Koloniale Studien* (1928).

Meyer, Heinrich (1759–1832), Ger. painter and art critic, made the acquaintance of Goethe in Rome (1786), and in 1797 settled down in Weimar, where he enjoyed the great poet's friendship, and inspired him, it seems, with many of those opinions on art and aesthetics which appeared in *Kunst und Alterthum*; *Winckelmann und sein Jahrhundert* (1805, with Goethe), etc. Besides editing Winckelmann's works (1808–20) M. himself composed a hist., badly arranged, of Gk. and Rom. art (1821).

Meyer, Heinrich August Wilhelm (1800–1873), Ger. Protestant divine and exegete, b. at Gotha, studied theology at Jena. He became pastor in 1841, but gave up the active ministry in 1848 and settled in Hanover. His great work was his N.T. commentaries, which appeared in the monumental *Kritisches-exegesischer Kommentar zum Neuen Testamente* (16 vols., 1832–59), or which he was chief author.

Meyer, Julius Lothar (1830–95), Ger. chemist, b. at Varel, Oldenburg, studied medicine at Zurich, chem. under Bunsen at Heidelberg, and physics at Königsberg under Neumann. Virchow was his teacher in pathology, but under the influence of K. F. W. Ludwig and Kirchhoff he turned his attention to physiological chem. and mathematical physics. In 1859 he began to lecture on physics and chem. at Breslau. During the Franco-Prussian war he tended the sick and wounded at Karlsruhe Polytechnic. From 1870 onward he held the chair of chem. at Tübingen. In his *Die modernen Theorien der Chemie* (1864) he helped to develop the startling theory of the periodic classification of elements, and recalculated the atomic weights.

Meyer, Victor (1848–97), Ger. chemist, b. at Berlin. He became prof. of chem. at Zürich in 1872, at Gottingen in 1885, and four years later succeeded Bunsen, his old master, at his own univ. of Heidelberg. Besides important work in organic chem., he discovered thiophene and a convenient method of ascertaining the density of vapours. He was awarded the Davy

medal by the Royal Society in 1891. See life by R. Meyer, 1917.

Meyerbeer, Giacomo, really Meyer-Ber (1791–1864), Ger. musical composer of Jewish extraction, b. in Berlin, son of Herz Beer, a hunchback. He appeared as a prodigy pianist at the age of six, and studied under Clementi, Zelter, and the Abbé Vogler. Abandoning his early intention of being a pianist, he went to Venice to study composition (1815), where he composed several operas in the style of Rossini, none of them of any importance except the last, *Il Crociato in Egitto* (1824). In 1826 M. took up his abode in Paris, where his chief operas were produced: *Robert le Diable* (1831); *Les Huguenots* (1836); and *Le Prophète* (1843). Meanwhile he received the appointment of *kapellmeister* to the king of Prussia and, in Berlin, produced a Ger. opera entitled *Ein Fäulnisse in Schlesien*, in which Jenny Lind (q.v.) made her first appearance in Prussia, and was his prima donna thereafter. Weber was his life-long friend, and it was Weber who had persuaded M. to give up imitations of It. opera despite his success in them. In Berlin M., after the death of Weber, produced the latter's *Euryanthe* and, with equal selflessness, procured the acceptance of *Rienzi* and *Der fliegende Holländer*, the earliest of the operas of Wagner, who was then living in poverty and exile. In 1854 he produced *L'Étoile du nord* at the Opéra comique, and in 1859 *Le Pardon de Ploermel*. His last major work was *L'Africaine* (1865), a revision of which was in preparation at the Académie when he was seized with a sudden illness and d. The opera was, however, produced with scrupulous attention to M.'s ideas.

M. is one of the most important figures in the hist. of Fr. opera, both *grand* and *comique*. His work is remarkable for its brilliant effects and powerful climaxes, rather than for any mastery of form or coherence. He wrote much instrumental and choral music of a less ambitious nature, and about forty songs.

Meyerhof, Otto Fritz (b. 1884), Ger. physiologist, b. at Berlin, educated at Königliche Wilhelms gymnasium, Berlin. Prof. at Kiel, 1918–24, he was a member of the Kaiser Institute for biology, Berlin-Dahlem, 1924–29, and director of research at the Institute of biology, Paris, 1938–40. He investigated conversion of energy and process of spasm in muscles, publishing *Energy transformation and Chemistry of Muscle* (1922), and shared the Nobel prize for physiology and medicine with A. V. Hill, in 1923. Other publs., on respiration and fermentation of cells and enzymes (in Eng.): *Chemical Dynamics of Life Phenomena* (1924) and 'Chemical Studies on Muscle' in *Journal of General Physiology* (1926).

Meyer-Lübke, Wilhelm (1861–1936), Ger. philologist, b. at Düsseldorf. He studied at Zurich and Berlin, and in 1887 was made prof. of romance philology at Jena, holding the same chair at Vienna Univ. in 1890. He pub. *Grammatica Linguae Graeca vulgaris*, by S. Portius, with a grammatical and historical commentary, and *Grammatik der romanischen*

Sprachen (1890–1900), which is his greatest work.

Meynell, Alice Christiana (1849–1922), Eng. poet and essayist, daughter of T. J. Thompson. She spent most of her young days in Italy. Her first vol. of verse, *Preludes* (1875), was illustrated by her sister, Lady Butler, the painter of 'The Roll Call,' and won warm praise from Ruskin. Then, for nearly twenty years, poetry was left aside for marriage (to Wilfrid M., q.v.) and journalism. For A. M. children were part of marriage. Her *Poems*, pub. in 1893, definitely estab. her fame, while her *Rhythms of Life*, pub. at the same date, placed her in the front rank of living writers in prose. This was followed by 'the Colour of Life and other Essays' (1896); *The Children* (1896); *The Flower of the Mind* (1897, an anthology of Eng. verse); and *The Spirit of Peace* (1898). She also ed. the *Selected Poems* of Hake and the *Poetry of Pathos and Delight* of Patmore, and contributed to the *National Observer*, the *Pall Mall Gazette*, the *Saturday Review*, etc. Among later works are *London Impressions* (1898); *John Ruskin* (1900); *Later Poems* (1901); *Children of the Old Masters*; *Italian School* (1903); *Ceres Runaway* (1910); *Mary, Mother of Jesus* (1912); *Collected Poems* (1913); *Essays* (1914); and *Last Poems* (1923). Her writing is akin to that of Christina Rossetti in fine and delicate craftsmanship. Her poetry, it is said, consists less of sounds than of silences. This is also true of her prose. She was at once impassioned and austere, but her emotions were under severe control to the end, that her reticence might prevail. See life by Viola Meynell, 1917.

Meynell, Sir Francis (b. 1891), Eng. book designer and typographer, the younger son of Wilfrid M.; educated at Downside, and Trinity College, Dublin. From 1918 to 1920 he was a director of the *Daily Herald* and in 1923 founded the Nonesuch Press (q.v.), which became known for many well-produced and scholarly eds. of standard authors. The press also pub. the successful anthology, *The Week-end Book* (1924), of which M. was co-editor. In 1945 M. became a member of the Council of Industrial Design, and from that date has been typographic adviser to H.M. Stationery Office. During the Second World War he was adviser to the Board of Trade. He was knighted in 1946. Pubs.: *The Typography of Newspaper Advertising* (1929); *Sixteen Poems* (1945); and *English Printed Books* (1946).

Meynell, Wilfrid (1852–1948), Brit. journalist and editor, poet and essayist, b. at Newcastle upon Tyne, son of an affluent small-colliery owner and husband of Alice Thompson (see MEYNELL, ALICE CHRISTIANA). In their early married days M. and his wife pub. the *Pen*, a critical monthly review of brief existence. A more significant joint venture was *Merry England*, a monthly of twelve years' duration, the contributions to which were largely their own work. M., who left the Society of Friends for the Rom. Catholic Church at eighteen, ed. for Cardinal Manning, his greatly revered friend, the

Register, which he conducted according to a home rule and 'Young England' policy, in contrast with that of the *Tablet*, which was the paper of Rom. Catholic Toryism. Meanwhile M. was writing stories, verse, and articles, sometimes under his own name and sometimes as 'John Oldcastle,' as in his practical handbook, *Journals and Journalism* (1880), as 'Francis Phillimore,' and anonymously. Throughout the forty-five years of their married life M. and his wife collaborated in numerous literary projects of one kind or another. Alice M. d. in 1922, and M. survived her for twenty-six years. His 'services to literature,' a phrase which properly covered his devoted help to many young writers, as well as his own voluminous writings, including the editing of a sixteen penny series of classics, were publicly recognised when he was ninety by the award of the C.B.E. Perhaps his greatest service to literature was his discovery of Francis Thompson some time after the starving poet had sent to *Merry England* a contribution written on blue sugar-bag paper. When at last M. read it he sought the poet everywhere until he found him. For nineteen years Thompson was an adopted son in or near the M. household. M. not only ed. Thompson's collected works, but also pub. them. Of his own writings, which are mostly uncollected from the literary monthlies and weeklies of the nineties, his story *Aunt Sarah and the War* (1914) had the largest public success.

Meze, seaport in the dept. of Hérault, France, 20 m. S.W. of Montpellier. Wines are made and salt is an important product. Pop. 5000.

Mezen: 1. Tn. and seaport in the Archangel Region of the R.S.F.S.R., 15 m. from the mouth of M. R. There are saw-mills and wood-working plants, and paper manufis.; timber is exported. Pop. 1800. 2. Riv. of N. Russia, with a length of 545 m., which flows into the White Sea through M. Bay.

Mezeray, François Eudes de (1610–83), Fr. historian, b. near Argentan, and educated at Caen Univ. and in Paris. After serving in two or three campaigns in Flanders he pub. his *Histoire de France*, on the completion of which, in 1651, he became historiographer of France and a member of the Fr. Academy. He also wrote *L'histoire des Turcs*, 1612–1649.

Mezereon, or *Daphne mezereum*, small fragrant shrub (family Thymelæaceæ), indigenous to Britain, with fragrant red or white flowers borne in Feb. and followed by red berries. It is poisonous, but has medicinal uses.

Mezhels, see under SENUSI.

Mézières, fort. tn. in the dept. of Ardennes, France. Founded in the ninth century it now has ammunition factories and copper foundries. Captured by the Germans in Aug. 1914 it suffered heavy destruction on their withdrawal in 1918 (see also MANGIN). Pop. 10,200.

Mező-Berény, manufacturing tn. 6 m. N.W. of Békés, Hungary. Pop. 13,000.

Mezöhegyes, mrkt. tn. of Csánad co., Hungary, 30 m. N.E. of Szegedin. There

is horse breeding and sugar refining. Pop. 7500.

Mezőkővezsd, tn. in Borsod co., Hungary, 50 m. W.N.W. of Debreczen. Pop. 20,800.

Mezötür, m.rkt. tn. of Hungary, near Debreczen, with manuf. of pottery. Pop. 28,100.

Mezozoth, or **Mezurzah**, narrow hollow strip of wood or other substance, with a piece cut out near the top and containing a scroll of parchment on which are written or printed selections from the chapters of the Sherrai (Deut. vi. 4, 9, and xi. 13, 20). On the back of the scroll is written the Heb. word 'Almighty,' and this is left exposed when the scroll is fixed in the case. The M. is hung up outside or inside Jewish houses. All Jews, when either going in or coming out of a dwelling, touch the word with their right hand, and repeat the eighth verse of Psalm cxxi.: 'The Lord shall preserve thy going out and thy coming in from this time forth and even for evermore.' See M. Friedlander, *Text Book of Jewish Religion*, 1891.

Mezzanine, see ENTRESOL.

Mezzofanti, Giuseppe (1774-1819), It. linguist and cardinal, was the son of a carpenter, and b. at Bologna. He was educated in his native city, and in 1797 became prof. of Arabic in the univ. there, and later assistant librarian of the institute and prof. of Gk. In 1831 he went to Rome, and having attracted the attention of Pope Gregory XVI. was made a cardinal in 1838. He acquired a considerable reputation as a linguist, and spoke in all soine fifty-eight languages. See Lives by C. W. Russell, 1858, and A. Bellesheim, 1800.

Mezzo-soprano, species of voice which has a somewhat lower range than a soprano, but is higher than a contralto. It is the voice more usually found in women, and has a varying compass generally from A beneath the treble stave to F on the fifth line.

Mezzotint, method of engraving invented about the middle of the seventeenth century, and known on the Continent as 'la manière anglaise.' Ms. are engraved on copper, which, in the early part of the nineteenth century, were sometimes steamed. The method of mezzotinting is to cover the surface of the plate, in all directions, uniformly with fine dots, sometimes as many as one hundred to the inch, by means of a rocker or a roulette. The former is a chisel-shaped instrument with a slightly curved edge, serrated with fine teeth. A print from the plate so prepared, in consequence of the number of cavities and the burr raised round them, would appear a deep uniform black. The plate is then worked on with a 'scraper' to obtain the high lights, and the burnisher is finally used to obtain the highest lights, the artist working from dark to light. Mezzotinting was introduced about the reign of Charles I. by Prince Rupert, the inventor being L. von Siegen, and the great exponents of the method are J. McArdell, Fisher, Dixon, V. Green, J. R. Smith. See also ENGRAVING.

Mfumbiro, chain of volcanic mts. near

the S.W. boundary of Brit. E. Africa. It consists of two groups: the W. which lies directly N. of Lake Kivu, and contains the active volcanoes Kirungacha-gongo and Kirunga-namagira, and the E. where the loftiest peak is Karissimbi (14,683 ft.).

Mglin, tn. in the Chernigov Region of the Ukrainian S.S.R., about 125 m. N.E. of Chernigov. Pop. 8000.

Mho (the reciprocal of the ohm), practical unit of electric conductivity. Thus if a wire had a resistance of 10 ohms its conductivity would be $\frac{1}{10}$, or 0.1 mho.

Mhow, tn. in Indore, India, with a military cantonment. Pop. (including garrison), 40,000.

Miagao, trading and manufacturing tn. on the S. coast of Panay Is. in the Philippines. Pop. 25,000.

Miami, tribe of N. Amer. Indians, belonging to the Algonquian family which originally inhabited Wisconsin. The survivors live on a reservation in Wabash co., Indiana. They took the side of the Eng. in the Amer. war.

Miami: 1. City and co. seat of Dade co., Florida, U.S.A., on M. R. and Biscayne Bay. It is the centre of a country famous for the production of grape-fruit, pineapples, and winter vegetables, and there is a considerable amount of fishing. There are sponge fisheries in Biscayne Bay. M. is just N. of the tropics, and is a flourishing winter health resort. It is studded with skyscrapers like a small New York. It is an important taking-off ground for air services to the W. Indies and S. America. It is subject to visitation by hurricanes, the worst occurring in 1926. Pop. 172,100. 2. Riv. in Ohio, joining Ohio R. in the S.W. of the state. Length 155 m.

Miami University, state univ. in Oxford, Ohio, U.S.A., founded in 1809. It has nearly 600 students, and a library of 40,000 vols. The study of Pan-Amer. problems is a speciality.

Miani, or **Meanees**, vil. in Sind, India, on the Indus, 5 m. N. of Hyderabad. A battle was fought here in 1843.

Miaotse, aboriginal tribes inhabiting the int. dists. of S.W. China. They originally occupied the central prov. of the empire, but were driven S.W. to their present abode by the Chinese.

Miaskovsky, Nikolai Yevkovlevich (b. 1818), Russian composer, b. near Warsaw, son of a Russian military engineer stationed in Poland. M. joined the army, but resigned his commission in 1907, already having composed sev. pianoforte preludes, studied with Glère and Krizhanovsky, and entered the St. Petersburg Conservatoire in 1908 to study under Rimsky-Korsakov. He was badly wounded in the First World War. In 1921 he became prof. of composition at the Moscow Conservatoire. His works include the oratorio *Kirov is with us*, twenty-five symphonies, the symphonic poems *Silence* (after Poe) and *Alastor* (after Shelley), and numerous other pieces. See G. Abraham, *Eight Soviet Composers*, 1943.

* **Miasma** (Gk. *pínna*, corruption or pollution), see MALARIA.

Miava, industrial tn. 46 m. N.N.E. of

* H

Bratislava, Czechoslovakia, on the R. M. Pop. 11,000.

Miazz, Giovanni (1699 c. 1780), It. architect, was a native of Bergamo. Among his best-known works are the church of S. Giambattista at Bassano and the theatre at Treviso.

Mica, group of minerals which are distinguished by their very perfect basal cleavage, causing them to split readily into thin flakes, and by their vitreous, pearly lustre. The Ms. are complex silicates of aluminium and either alkali metals or iron and magnesium, together with water and occasionally fluorine. Average hardness 2.5. Sp. gr. about 3. They are frequently found in schists, gneisses, and granites. Muscovite or white potash M. is clear and colourless, and may be obtained in large, flexible, and elastic plates. It was formerly used for glazing windows under the name of Muscovy glass, and is still in use for lamp chimneys. Lepidolite, or lithium M., is generally rose-red or violet in colour, while biotite, magnesia M., is black or dark brown. Other types of M. are phlogopite, lepidolamite, paragonite, and Zinnwaldite. The minerals of the M. group are alike in having a prism angle of nearly 60°, thus simulating hexagonal structure, perfect basal cleavage, and in crystallising in the monoclinic (or oblique) system.

Michael, spoken of in Dan. x. 13, 21; xii. 1, as one of the chief of the heavenly host and as the guardian of Israel. It is also as the guardian of the church that he appears in Jude 9 and Rev. xii. 7. His festival day is Sept. 29 (see MICHAELMAS DAY). In the Rom. Church he is also commemorated on May 8 in honour of his apparition in 492 to a herdsman of Monte Gargano.

Michael (Mihail), king of Rumania. See under CHARLES (CAROL) II.; RUMANIA, History.

Michael (1596–1645), first tsar of Russia of the house of Romanov. He was elected tsar by the national assembly, Feb. 21, 1613, and crowned on the following July 22. He freed his ter. from the gangs of robbers which had made life precarious, and by the treaties of Stolbova (1617) and Deulina (1619) he made terms with Sweden and Poland. From 1619 to 1633 he ruled jointly with his father, the Patriarch Philaret of Moscow. See R. Nisbet-Bain, *The First of the Romanovs*, 1905.

Michael, name of a succession of eight emperors who, at different periods, occupied the throne of the E. from 811 to 1282, the last being Michael VIII., the founder of the Palaeologic dynasty.

Michael, St. and St. George, Order of, order of knighthood which was originally founded for the Ionian Isles and Malta in 1818. It was reorganised in 1869, so as to admit crown servants connected with the colonies. It now consists of not more than 100 Knights Grand Cross, 300 Knights Commanders and 600 Companions, and is essentially an order for men who have rendered distinguished public service for the empire.

Michael, 'the Brave' (1558–1601), voi-

rode of Wallachia, succeeded to the throne in 1593, and secured for Wallachia during his reign a place in world hist. He invaded Turkish ter., aided by Sigismund Báthory, and took by storm Rustchuk, Silistra, and other places on the Danube, and also defeated a large Turkish and Tartar army which invaded Wallachia. In 1595 he gained a further victory at Mantin, and subsequently defeated Sinan Pasha, who invaded Wallachia with 100,000 men, and stormed Bucharest. His independence was acknowledged by the sultan in 1597. In 1599 he invaded Transylvania (Sigismund's successor), and was proclaimed prince, and, having expelled the voivode of Moldavia, united under his sceptre three principalities. He was, however, driven out of Transylvania by a revolt, but returned, and with the imperial Gen. Basta defeated the Transylvanian forces at Goroslo, expelling Sigismund Báthory. He was murdered in 1601 by Basta's orders.

Michaelis, Johann David (1717–91), Ger. biblical scholar, b. at Ille. He was educated in his native city, and lectured there for some time. He visited England in 1741–42, and also travelled through Holland, and in 1746 was appointed prof. of philosophy at Gottingen, and in addition prof. of oriental languages in 1750. Among his works are *Mosaisches Recht* (1770–71); *Orientalische und exegetische Bibliothek* (1775–85); *Supplementa ad Lexica Hebraica* (1781–92); *Neue O. und E. Bib.* (1786–91); *Litterarischer Briefwechsel* (1794–96); and *Introduction to the New Testament* (4th ed., 1823). He also pub. a reprint of Lowth's *Praelectiones*, with important additions (1758–62), and a Ger. trans. of the Bible with notes (1773–92).

Michaelis, John Benjamin (1746–72), b. at Tittau. He studied medicine at Leipzig, but being attracted by poetry pub., with Gellert and Weisse, a collection of fables, and soon after gave up his profession of a doctor. His works, which consist of odes, satires, lyrics, comic operas, etc., were pub. at Vienna in 1791.

Michaelis, Karin (b. 1872), Dan. writer, b. at Itzanders, wife of Sophus M. (1865–1932), also a writer. Author of romantic novels displaying an intimate knowledge of female psychology, and coined the phrase 'the dangerous urge.'

Michaelmas Daisy, name given by gardeners to *Aster tradescantii*. Known also by this name is the sea aster or starwort (*A. trifolium*).

Michaelmas Day, festival of St. Michael and All Angels, celebrated in the W. Church on Sept. 29. M. is frequently used for dating terms, etc.

Micah, the Morashite (*i.e.* native of Moresheth, a vil. near Gath, on the confines of Judah), one of the twelve minor Heb. prophets. He was the younger contemporary of Isaiah, and is referred to in Jer. xxvi. 18 as having prophesied in the days of Hezekiah and Ahaz, kings of Judah. Almost all critics are agreed that only a part of the book that bears his name can be attributed to the prophet M. himself. Interpolations, generally post-

exile, are frequent, and continually break the chain of thought. Thus the first three chapters deal with the approaching destruction of Samaria, and with the sinfulness of Judah, but verses 12 ff. of chap. ii. deal with the restoration of the people, and plainly presuppose the exile. Chaps. iv. and v. are Messianic, dealing with the future glory of Zion and the world-wide rule of the Messiah. See commentaries by T. K. Clucyne, 1882; G. A. Smith, 1896; J. Wellhausen, 1899; and G. W. Wade, 1925. See also G. C. Findlay, *The Books of the Prophets*, 1913, and T. H. Robinson, *Prophecy and Prophets in Ancient Israel*, 1923.

Mica Schist, schistose or fine-grained foliated rock, composed of alternating thin lenticular sheets of mica and quartz. It is a typical metamorphic rock, and occurs very largely in the Highlands, where the older strata outcrop (q.v.). The contained mica is generally muscovite; and garnet, kyanite, schorl, felspar, chlorite, etc., are accessory minerals.

Michaud, Joseph François (1767-1839), Fr. historian and publicist, b. at Albens, Savoy. He was educated at Bourg-en-Bresse, and went to Paris in 1791 where he became the editor of *La Quotidienne*, in which he espoused the royalist cause. He narrowly escaped death during the Reign of Terror, and after 1800 abandoned journalism and began to write books. His *Biographie moderne, ou dictionnaire des hommes qui se sont fait un nom en Europe depuis 1789*, pub. in 1806, was the earliest work of its kind. His pub. *Histoire des croisades*, his prin. work; *Correspondance d'orient*, as a result of his visit to Syria and Egypt for the purpose of collecting material for his *Histoire* and other works.

Michaux, André (1716-1802), Fr. botanist and traveller, b. in Sardony. He made journeys to sev. parts of the world, first to England (1779), from which country he introduced into France sev. new varieties of trees and shrubs; second, to the Auvergne and the Pyrenees (1780), bringing back sev. species of grain; third, to Persia (1782), whence he brought back a fine herbarium and valuable seeds; fourth, to N. America (1785), travelling from Hudson Bay to Florida and the Mississippi. Unfortunately nearly all his collection was lost.

Michel, Clémence Louise (1830-1905), Fr. anarchist, b. at Broncourt in Haute-Saône. She became a teacher in Paris, but soon gave this up, for social and political work. She joined the Communists at the outbreak of their rising of 1871 and was transported to New Caledonia. On her release she returned to Paris and joined another anarchist rising, for which she was sentenced to six years' imprisonment. She was, however, released after three years, in 1886, and soon afterwards went to London. She returned to Paris in 1895, where she d. Her works include *La Misère; Mémoires* (1886); *Les Microbes humains* (1886); *Le Monde nouveau* (1888); *Les Crimes de l'époque*; and *La Commune* (1898). See E. Giraut, *La Bonne Louise*, 1906.

Michel de Notredame, see Nostradamus.

Michel, Francisque (1809-87), Fr. antiquary, b. at Lyons, became prof. of literature at Bordeaux. He visited England and Scotland to carry out his archaeological researches. He ed. old Fr. works, such as *La Chanson de Roland*, *Chansons de Coucy*, trans. Eng. works into Fr., and pub. original works, the chief of which are *Histoires des races maudites de la France et de l'Espagne*; *Le Pays basque*; and *Les Bretons en France et les français en Bretagne*.

Michel, Nicolaievich (1832-1909), Russian prince, was brother to Tsar Alexander II. He was governor-general of the Caucasus in 1863, field marshal and later director-general of artillery, and president of the council of the empire. During the war with Turkey in 1877 he captured Ardahan and Kars.

Michelangelo, or Michael Angelo, Buonarroti (1475-1564), It. sculptor, architect, painter, and poet, b. at Caprese, of an honourable and anc. though poor family. After being at school with Maestro Francesco da Urbino, he made friends with Francesco Granacci, a pupil of Domenico del Ghirlandaio, with whom M.'s father, although holding art in contempt, at length allowed him to study. His talent even at this early age was very marked, so that he was chosen by Ghirlandaio as one of the youths whom Lorenzo de' Medici, the Magnificent, allowed to work in his garden under Bertoldo. Here he executed the 'Faun's Head,' which so delighted Lorenzo that he took him into his estab. and treated him as his son. M. was between fifteen and sixteen years of age when he entered Lorenzo's house, and he stayed with him until the latter's death in April 1492; whilst there he executed the bas-relief called 'The Rape of Belona,' or 'The Battle of the Centaurs,' now in the Casa Buonarroti, Florence. On the death of Lorenzo M. returned to his father's house for a short period until Pier de' Medici, Lorenzo's heir, requested his presence. He left Florence, it is said, on account of a visionary premonition which one Cardice had of the fall of the Medici, and went to Bologna, where Messer Gian Francesco Aldovrandi befriended him. Returning to Florence in 1496 he went to Rome to the Cardinal di San Giorgio, who had bought a Cupid by M. under the impression that it was a real antique. During his stay in Rome M. executed a Cupid (now at S. Kensington) and a Bacchus (now in the National Museum, Florence) for Messer Jacopo Galli, and the Madonna della Pietà (now in St. Peter's, Rome) at the request of Cardinal Rovano. In 1501 he returned to Florence on family affairs, and in 1504 carved the colossal statue of David, nine braccia high, out of a block of marble spoilt in the roughing out brought from Carrara, probably by Agostino di Antonio di Duccio. This is now in the Accademia delle Belle Arti, Florence. In the same year he commenced the cartoon for the decoration of the council hall at Florence

a work on which Leonardo da Vinci was also engaged. The paintings of both have been lost.

After the death of Pope Alexander VI. Julius II. called M. to Rome, and commissioned him to make his monument. The design for this work was very highly approved by the pope, and in April 1505 M. went to Carrara to superintend the quarrying of the necessary marble, an operation which occupied over eight months. The architect Bramante, who was jealous of M., influenced the pope against him, and shortly after his return from Carrara he was refused admittance to the papal antechamber. In anger he returned to Florence, where he stayed



MICHELANGELO

until the pope had sent three briefs demanding his return; at length he went to see the pope at Bologna, and whilst there he executed a portrait statue of Julius in bronze, three times life-size, which was placed on the front of the Church of San Petronio, but destroyed on the return of the Bentivogli. When M. returned to Rome Bramante persuaded the pope that it would be a bad omen for his tomb to be built before his death, and induced him to ask M. to paint the vaulting of the Sistine Chapel, thinking that such a work would show his genius in a less favourable light. Although unwilling M. yielded to the importance of the pope, and finished the work, unaided save for workmen and writers for the lettering, in twenty months. This, his greatest work in painting, represents the creation of the world and of man, the flood, and various biblical stories. When the Sistine Chapel was completed M. again became involved in 'The Tragedy of the Tomb.' On his return from Florence, whither he had gone after the completion of the chapel, he again started work on his designs for the tomb of Julius, but the death of the latter interrupted the work. Leo X., Julius's

successor, ordered him to undertake the ornamentation of the facade of San Lorenzo at Florence. This was a great disappointment to M., but his protests were unavailing. He was also obliged to spend six years in procuring marble from the quarries of Pietrasanta. In 1521 M. executed the 'Risen Christ,' now in the church of Santa Maria Sopra Minerva, Rome, a work which was finished, and therefore marred, in details, by other hands. When Clement VII. became pope he lost no time in setting M. to work, and by 1524 the tombs of the Medici were fairly under way. These were not destined to be finished, and it was not until 1535 that M. finished what work there is of his in the building, including the grand figures of Day and Night, Morning and Evening. In 1529 he had been appointed general over the construction of the walls and defences of the city of Florence, which fell in the following year. After this 'The Tragedy of the Tomb' was at length completed; the finished work contained only the 'Moses' by M. himself. In 1534 he was commissioned by Pope Paul III. to do the 'Last Judgment' in the Sistine Chapel, a great work which occupied him for six years. In 1547 Pope Paul conferred the post of architect-in-chief at St. Peter's upon M. and he designed the dome. In 1549 the two frescoes for the walls of the Capella Paolina, Rome, were completed, representing the Martyrdom of St. Peter and the Conversion of St. Paul.

All through his life M. composed sonnets when his sculpture was not going well and he was disturbed; the best are addressed to Vittoria Colonna, the widow of the marquis of Pescara, whose friendship was the great solace of M.'s life. Along with her praises the main themes of his poetry are the Christian faith, the joy of platonic love, and the power and mysteries of art. His poetic style is strenuous and concentrated and he wrote with labour and much correction, always with the goal of perfection before his eyes, urged on by the same ardour and impetuosity that characterizes his work as a sculptor and painter. The death of Vittoria Colonna in 1517, together with an infirmity which began to afflict him in 1514, left him broken in health and heart. He d. on Feb. 18. 1564. See also ITALIAN ART: MENICI CIRAPEL. See A. Condivi, *Vita di Michelangelo Buonarroti*, *Scritta da A. C., suo discepolo*, 1553 (ed. by P. d'Ancona, 1938); (i). Vasari, *Le Vite dei più eccellente Pittori, Scultori, et Architetti*, 1647; J. A. Symonds, *The Sonnets of Michael Angelo Buonarroti and Tommaso Campanella*, 1878, and *The Life of Michelangelo Buonarroti*, 1893; C. Holroyd, *Michael Angelo Buonarroti*, 1903; E. Steinmann and R. Wittkower, *Michel Angelo Bibliographie*, 1910-1921, 1927; and C. de Tolnay, *The Medici Chapel*, 1948; also A. C. Benson and H. F. W. Tatham, study in 'Men of Might' series, 1923; and studies by C. Clement, 1930; Lord Finlayson, 1936; and C. de Tolnay, 1946. Michelet, Jules (1798-1874), Fr. historian, b. in Paris, was the son of a printer. He was educated at the Lycée

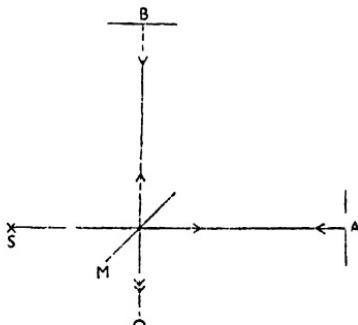
Michelagnone, and in 1821 was appointed prof. of hist. in the Collège Rollin. His first works appeared in 1825-27, and were concerned with modern hist., and in 1827 he was appointed *maitre de conférences* at the Ecole normale, becoming assistant to Guizot at the Sorbonne in 1830. In 1831 he pub. the *Introduction à l'histoire universelle*, and soon afterwards entered upon his chief work, the *Histoire de France* (from early times to the outbreak of the revolution), publishing about the same time (*Oeuvres choisies de l'ico*, the *Mémoires de Luther*, and the *Origines du droit français*). In 1838 he was appointed to the chair of hist. at the Collège de France, and pub. his lectures on *Le Prêtre, la femme et la famille*, and *Le Peuple*. In 1839 his *Histoire romaine* appeared, and besides his great hist. he wrote *Histoire de la révolution française* (1893-99). He also wrote books on natural hist.: *L'Oiseau* (1856); *L'Insecte* (1859); *La Mer* (1861); and *La Montagne* (1868); as well as *Les Femmes de la révolution* (1854); *L'Amour* (1859), one of his most popular books; *La Femme* (1860); *La Sorcière* (1862); *La Bible de l'humanité* (1864), an historical sketch of religion; and *Nos fils* (1869), a treatise on education. His complete works were pub. 1893 ff.

Michelson, Albert Abraham (1852-1931), Polish-Amer. physicist, b. at Strelno, near Posen; lived in the U.S.A. from 1854 until his death. A distinguished prof. at the univ. of Chicago, M. was the first Amer. scientist to win the Nobel prize; in the same year (1907) he was awarded the Copley medal of the Royal Society. His greatest achievement was the construction of the interferometer (q.v.) that bears his name, and its applications to the determination of the standard metre in Paris, to the measurement of the angular diameter of a star (Betelgeuse) for the first time (1920), and to an attempt, made in collaboration with Morley, to detect the motion of the earth through the ether. The negative result of this experiment was the prelude to Einstein's theory of relativity. Other notable achievements were the determination of the velocity of light and the construction of the échelon diffraction grating for the examination of the fine structure of spectral lines. His publs. include *Velocity of Light* (1902); *Light Waves and their Uses* (1903); and *Studies in Optics* (1927). See also MICHELSON-MORLEY EXPERIMENT.

Michelson-Morley Experiment. In the nineteenth century light was believed to travel through a medium called the ether, which was supposed to permeate all space and all bodies. It was further supposed that all bodies, including planets and celestial objects, moved through this absolute ether without disturbing it. If these suppositions were correct, then it would be possible to refer the motions of all celestial bodies to axes fixed in this absolute ether. Such motions would be absolute in the real sense that they were measured relative to these axes.

In order to test these hypotheses Michelson and Morley in 1887 performed an experiment to determine the velocity

with which the earth moved through the other. The idea that prompted the experiment can best be understood by considering the following problem. Suppose a man can row a boat in still water with a velocity of c m.p.h. If he now rows the boat in a riv. that is running with a velocity of v m.p.h., a distance l m. upstream and then back l m. to his starting point, what is the time he takes for this double journey? The first half of the trip takes him $\frac{l}{c-v}$ hrs., the return $\frac{l}{c+v}$ hrs., so that the time for the whole journey is $\frac{l}{c-v} + \frac{l}{c+v}$, which is equal to $\frac{2lc}{c^2 - v^2}$ hrs. If he rows across the stream for a distance l m. and back again, a simple calculation shows that the time taken is $\frac{2l}{\sqrt{c^2 - v^2}}$ hrs. In other words, the experiment demonstrates that the riv. is actually running, and it enables the man to determine the velocity v m.p.h. with which it is running. This idea may be applied to the problem of the earth's velocity through the ether. Michelson



THE MICHELSON-MORLEY EXPERIMENT

and Morley's apparatus (essentially Michelson's interferometer) is represented in the figure. Light from a source S strikes a half-silvered mirror M, so that part of the light is reflected to the mirror at B, while part is reflected at the mirror A. The two trains of light return to M and are there superposed to form interference fringes seen by an observer at O. The experimenters arranged that MA, for example, was parallel to the direction in which the earth was moving, so that the light that travels with velocity c m.p.h. relative to the still ether, would travel upstream from M to A with a velocity $(c-v)$ m.p.h. relative to the mirrors, and back downstream with a velocity $(c+v)$ m.p.h. to the mirrors. At the same time the light travelling along MB and back again moves with a velocity $\sqrt{c^2 - v^2}$ m.p.h. relative to the mirrors, for MB is perpendicular to the direction in

which the earth is moving. Hence this journey would take less time than the other, and the difference between the two times could be detected and measured by observing the displacement of the interference fringes that would take place on rotating the whole apparatus through 90°, so that the positions of MA and MB are interchanged. The measurement would be one of extreme delicacy, because c is so very much greater than v that the difference between the two journeys is exceedingly small. Nevertheless the apparatus was capable of performing this measurement, but the result of the experiment was negative; subsequent attempts confirmed this. It was not possible to detect or measure the velocity with which the earth moved through the ether. This surprising result was at first thought to deny the existence of such an ether, but Lorentz and Fitzgerald pointed out that the experiment failed in its crucial test for the reason that the length of a measuring rod laid parallel to MA is different from its length when laid parallel to MB, and that this difference is of the exact amount to make the times for the journeys MA and MB the same. The Lorentz-Fitzgerald hypothesis of the contraction of the measuring rod was the beginning of the theory of relativity, and the hypothesis was inspired by the necessity for an explanation of the M.-M. E. See INTERFEROMETER; RELATIVITY.

Michigan, N.-central state of the U.S.A., having an area of 96,720 sq. m., of which 39,698 sq. m. are inland water. It is known as the peninsula state, because it consists of two peninsulas; the lower and larger lies N. of Indiana and Ohio, with Lakes Erie and Huron on the E. and Lake Michigan on the W. To the N., separated from it by the strait of Mackinac, is the upper peninsula, which adjoins Wisconsin on the S.W., and lies between Lakes Michigan and Superior; the Soo St. Marie Ship Canal, the busiest canal in the world, separates it from Canada on the W. The chief highlands are the Porcupine Mts. (1830 ft. above sea level) in the N.W., and the chief rivs. the Muskegon, Grand, St. Joseph, and Kalamazoo, which are important for the power they supply rather than for their navigation. There are more than 6000 small lakes. The state, formerly agric., is now chiefly industrial; the staple crops are oats, potatoes, hay, wheat, maize, beans, grapes, celery, peppermint, and sugar beet. Fruits, chiefly apples, are widely grown, and the live-stock, especially sheep, is considerable. Mineral wealth in the N. peninsula compensates for comparative infertility, and output averages over \$140,000,000 annually. Copper and iron are the chief products of the mines; coal, salt, and silver mines are also worked, and petroleum and Portland cement are other valuable products. The most important industry is the manuf. of automobiles, especially at Detroit. There are also manufs. of aeroplanes, paper, furniture, and machinery. Lumbering is very important, chiefly in the upper peninsula,

though not to so great an extent as formerly; reforestation is being carried on. There is some shipbuilding and a lake fishing industry. Communications by rail and water are good and there are 209 airports. Michigan Univ. was founded in 1837 at Ann Arbor, and has over 18,000 students. There is a Senate of thirty-two and a House of Representatives of 100 members, and in the national assemblies M. is represented by two senators and seventeen representatives. Detroit is the chief tn., pop. (1940) 1,623,000, and the state cap. is Lansing (pop. 79,000). Other important tns. are Grand Rapids (164,300); Flint (151,000); Saginaw (82,800); Pontiac (66,600); Dearborn (63,600); Kalamazoo (51,000); Highland Park (50,800); Hamtramck (50,000); Jackson (49,700); Bay City (48,000); Muskegon (47,700); Battle Creek (43,500); Port Huron (32,800); Wyandotte (30,700). Father Marquette, a Jesuit missionary, founded a settlement here in 1668. The state was ceded by the Fr. to the Eng. in 1760 and passed to America in 1796. It was admitted to the union in 1837. Pop. 6,249,000. See G. N. Fuller (ed.), *Michigan: a Centennial History of the State and its People*, 1939, and Federal Writers' Project, *Michigan: a Guide to the Wolverine State*, 1941.

Michigan City, lake port, 37 m. E.S.E. of Chicago, on Lake Michigan, in Laporte co., Indiana, U.S.A. Pop. 26,400.

Michigan, Lake, great lake of N. America, bounded on the N.W. and E. by Michigan, on the S. by Indiana, and on the W. by Wisconsin and Illinois. The strait of Mackinac connects it with Lake Huron. Area 22,400 sq. m. Length 325 m.; mean breadth 75 m.; mean depth 870 ft.

Michoacán, state of Mexico, having an area of 23,200 sq. m., and bordering on the Pacific for 101 m. The highlands lie S. of the Sierra Madre Occidental, Taucitaro (12,600 ft.) being the highest peak. The chief rivs. are the Lerma and the Balsas. The staple products are minerals (gold, silver, iron, coal, lead, copper, petroleum, etc.), cereals, fruit, coffee, and sugar cane. Morelia (pop. 77,600) is the cap. Pop. 1,182,000.

Michurinsk, see KOZLOV.

Micipsa, king of Numidia, was the son of Massinissa, and reigned from 148 to 118 B.C. Afraid of Jugurtha, his nephew, he sent him in 134 B.C. to Spain, to serve under Scipio.

Mickiewicz, Adam Bernard (1798-1855), Polish poet, b. at Zaosie, near Novogrodok in Lithuania. He was educated at Novogrodok until 1814, when he entered the univ. of Vilna. He was for a time a schoolmaster at Kowno. In 1824 on the condemnation of the members of the Philorhetian societies M. was, after imprisonment, banished to Russia. He had already pub. two vols. of miscellaneous verse, and on his arrival at St. Petersburg was at once received in literary circles with open arms. In 1840 he was appointed to a newly founded professorship of Slavonic literature in the Collège de France, but was expelled from his chair

by the Fr. Gov. in 1844, and was without employment until 1852, when the post of librarian at the Arsenal was obtained for him by Prince Napoleon. He d. of cholera at Constantinople whilst engaged in forming a Polish legion against Russia. His remains were, in 1890, removed to the cathedral at Cracow.

M. is the most inspired poet of Poland, and the flaming ardour of his poems, allied with their national melancholy, cause him to be the most popular in his own country, although, unfortunately, but little known in England. His chief works are *Konrad Wallenrod* (1828) and *Pan Tadeusz* (1834, trans. in Everyman's Library), in addition to his sonnets, *Ode to Youth*, etc. See L. Mickiewicz (his son), *Adam Mickiewicz, sa vie et son œuvre*, 1888, and M. M. Gardner, *Adam Mickiewicz*, 1911.

Mickle, William Julius (1731-88), Scottish poet, was the son of a Presbyterian minister of Langholm, Dumfriesshire. After failing in business he became censor to the Clarendon Press, pub. a Spenserian poem called the *Concubine* (1767, revised as *Syr Martyn*), and printed a very diffuse and rather poor trans. of Camoens's *Lusiad* (1775). Scott's *Kenilworth* is based on M.'s *and Cumar Hall*.

Micmacs, tribe of N. Amer. Indians of Algonquin stock, who formerly roamed Nova Scotia, New Brunswick, Prince Edward Is., and Newfoundland. During the colonial wars they were allies of the Fr. and adopted the Rom. Catholic religion. They now number about 3000.

Micon (fl. fifth century B.C.), Gk. painter and sculptor, was the contemporary of Phidias. He was renowned for his skill in drawing horses. His battles between the Amazons and Athenians decorated the walls of the Cerameicus and the temple of Theseus in Athens.

Microbe, see **BACTERIA**.

Microchemical Analysis, term used to include the methods employed for the recognition and determination of minute quantities of substances. For the *Qualitative* tests special reagents are often used. Thus, for example, sodium-bismuth thiosulphate will detect the presence of potassium (1 part in 57,000); alkaline phenolphthalein, decolorised by boiling with zinc powder, gives a red colour with water containing 1 part of copper per 100,000,000; potassium thiocyanate gives a blue colour with osmium compounds (1 part per 1,000,000) when shaken with ether. The *Spot* or *Drop Tests* are invaluable in this connection. They are carried out by allowing a drop of solution under test to react with a chosen reagent on filter-paper, when characteristic colours or stains appear. To quote two examples: (a) If a drop of a solution of a soluble lead salt is placed on a spot of ammoniacal hydrogen peroxide on filter-paper and allowed to stand, a blue coloration is observed when the spot is treated with a drop of benzidine dissolved in acetic acid (detects lead, 1 part in 33,000); (b) a drop of stannous chloride added to a spot of ammonium molybdate reagent on filter-paper gives an intense blue colour. On

warming (unless arsenic is present as well) the colour disappears.

Quantitative microanalysis has made rapid strides, and it is now possible to perform a quantitative analysis of an organic body, using as little as 2 mg. of the substance. This is invaluable, especially as many newly discovered bodies involve difficult and laborious methods even to obtain small yields. Progl was the pioneer of the new methods. Sensitive balances, e.g., the Kuhlmann (weighing to 0.002 mg.), are used, and minute attention to detail is insisted on. See F. Progl, *Quantitative Micronanalysis* (revised by Grant, 4th Eng. ed.).

Microcline, name given to a species of felspar, the crystallisation of which is triclinic, with polysynthetic twinning. A section cut parallel to the base reveals a reticulated structure, this being due to the regular intergrowth of twin lamellæ. Composition is silica 64.30, alumina 19.70, ferric oxide 0.71, potash 15.69, soda 0.48. Chemical formula $K_2(Al_2)Si_6O_{14}$. Some felspars, once regarded as orthoclase, are included in the M. species, as also are part of the chesterlite and anumestone.

Microcosm and Macrocosm. Arising from the belief of the ancients that the cosmos had a soul, the idea followed that the vital movements of man, the M. or little world, corresponded to those of the universe, the macrocosm or great world. From this astrology followed, or the belief in the idea that the movements of the heavenly bodies affect human lives. Pythagoras, Plato, the Stoics, and Paracelsus were exponents of the doctrine, as were the mystics of the seventeenth century. See **ASTROLOGY**.

Microcosmic Salt ($NaNH_4HPO_4 \cdot 4H_2O$), sodium ammonium phosphate, is so called because it is formed in the evaporation of human urine, and was regarded by the alchemists as an extract of the human microcosm. It is obtained by adding a strong solution of common sodium phosphate to ammonium chloride. The salt is used in blowpipe experiments, since it decomposes on heating, to give a glassy bead of sodium metaphosphate.

Microfilm Recording, see under **COPYING**.

Microliths. Vitreous rocks are not altogether void of crystalline material. Under the microscope numerous small crystallites are to be seen which may be drop-like (globulites), rod-shaped (blonites), or like coiled and twisted hairs (trichites). Besides these crystallites exist needle- and rod-shaped bodies called M., which are distinguished from the above by the fact that they react on polarised light (q.r.), and can be generally referred to some mineral species, felspar, anite, hornblende, olivine, etc. Combinations of simple M. occur presenting a curious forked appearance (skeleton crystals), and their linear arrangement indicates the fluxion structure of the rock. M. are also small points of fil. used to tip arrows in prehistoric times (see **STONE AGE**).

Micrometer, name given to instruments for measuring accurately very small angles or spaces up to a hundredth part of a

millimetre. Gascoigne invented the first instrument in the seventeenth century. There are sev. types, of which the following are the most important. Ms. consist generally of two very fine wires, one fixed and the other movable, placed in the focal plane of a telescope. The movable wire is fixed on a sliding plate, and can be moved parallel to the other by means of a screw until the object appears between the wires. The movement can be measured by means of the screw, the pitch of which is known; and the head of the screw is subdivided in order to measure fractions of a revolution. Thus the angular distance which the object subtends can be measured. In the *position wire* M. the two parallel wires are actuated by independent screws. The whole apparatus can be rotated in the plane of the wires, so that they can be placed in any direction, the angle through which it is rotated being measured upon a small circle called the position circle. Another type consists of an object glass divided into two semicircles, which can be separated by sliding, so causing the image formed respectively by each half lens to move. Dollond introduced a convex lens divided similarly to the above into the eyepiece of the telescope. Various other types, which depend on the phenomenon of double refraction have been introduced. The *circular* M., perfected by Fraunhofer, consists of a metal ring set in a perforated glass plate. The ring is placed in the focal plane of the telescope, the time when a star disappears at the outer ring and reappears at the inner ring being observed. This is chiefly used for determining the positions of stars. See HELIOMETER.

Micronesia (from Gk., small Is.), name of that part of the Pacific Ocean between long. 130° and 180° E. and between lat. 20° N. and the equator, which embraces the Ladronc, Pelew, Caroline, Marshall, and Gilbert archipelagoes. Except for the Gilbert Is., which are Brit., and Guam in the Ladronc Is. (Amer.), the Is. of M., formerly Ger., were, between the two world wars, under Jap. mandate. The South Sea Is. form a complex geographical, political, and racial patchwork, without any clear principles of order. But M. is the conventional name of the groups mentioned in this article as distinguished from the much more populous groups comprendiously designated Melanesia and Polynesia. The Micronesians show resemblances variously to the other two groupings, but are also marked by later overlays of race and custom from Malayan sources. Yet all scientific evidence points to the certainty that the local peoples of all three groups are traceable back to S.E. Asia by way of the Malayan Is. The oceanic pops. are believed to have numbered about 3,500,000 when the whites first arrived, and of these the Micronesians numbered only some 200,000 (these figures are, however, only a rough estimate). At the lowest point the Micronesians fell to a little over 80,000; in 1921 the total was 90,000, and to-day is about 105,000. The pop. of the Jap. mandate, taken as a whole, grew steadily in numbers after Japan took control, but if the Is. are

considered separately, quite marked differences appear. The W. groups show two clearly distinguishable pop. elements, the so-called Chamorros, who show greater racial and ethnic affiliation with the Malaysian peoples, and the Kanakas, who, like the rest of the Micronesians, are linked more with the Polynesians and, to some extent, the Melanesians. The Amer. Is. of Guam is unique in M., and indeed in the oceanic region as a whole, for here contact with whites goes back to the sixteenth century, when the Is. was a port of call for Sp. ships, and was a place of exile for lawbreakers and political prisoners from the Philippines. M. shows varied social systems and totemic clans were a widespread feature. Where peoples in M., as also in Melanesia, have been christianised, the formal change to a family organisation based on biblical standards is accomplished as part of the process of conversion. The groups are described under their separate titles. See F. M. Keesing, *The South Seas in the Modern World*, 1942; also R. Linton, *Ethnology of Polynesia and Micronesia*, 1928.

Microphone, piece of apparatus by which sound waves are converted into voice frequency electric currents which can then be transmitted by any of the known methods of electric communication or, after amplification, recorded. There are a large number of types of M. in existence, and some of these have sev. variations. The simplest example is that used in the standard G.P.O. telephone hand set instrument, which consists of a diaphragm behind which are packed granules of carbon backed by a solid surface. Sound waves meeting the diaphragm cause it to vibrate, so that, in turn, the granules are alternately compressed and released at the same frequency as the sound reaching the M. In this manner the electrical resistance of the carbon filling is made to change by the sound waves so that a current passing through it is an electrical reproduction of the original sound. These variations are passed to the telephone circuit via a suitable transformer. The quality of the output from such a M. is poor, but it is quite satisfactory for telephone communication work.

For broadcasting, recording, or other uses where quality is paramount, other types are generally employed. The moving coil M. can be compared directly with the moving coil loud speaker, whose action is the same but where the process is reversed and, in many of its variations, is capable of good quality output (see LOUD SPEAKER). The ribbon M., as its name implies, consists of a very light ribbon of aluminium foil suspended at its ends between the poles of a permanent magnet. The sound waves vibrate the foil and, as it moves to and fro between the magnet poles, voice frequency currents are induced in it. Another widely used type is the crystal M., which depends for its action upon the piezo-electric effect encountered in certain crystals such as Rochelle salt, when subjected to mechanical stress. The stress, in the case of the

M._s is produced by the sound waves striking a diaphragm to which the crystal is joined, when the electric impulses appearing across the crystal can be amplified and used in the normal way for communication, etc. In the better versions of this type of M., which are capable of higher quality, no diaphragm is used, but a number of crystal elements are connected so that their outputs combine. The sound impinges directly on the



RIBBON MICROPHONE

B.B.C.

crystals and this results in a very even frequency response free from objectionable diaphragm resonances. The output voltage is, however, very low, and considerable amplification must follow before the voltage reaches usable proportions.

Each type of M. mentioned has its peculiar application and, for this reason, all are in fairly general use for broadcasting, public address systems, and recording work.

Microphotography, see under PHOTO-MICROGRAPHY.

Microscope and Microscopy. The microscope is an instrument used to render fine detail visible. For this to be possible the object studied must be magnified enough to allow the eye to separate the required details, and these must present an ap-

preciable contrast to their surroundings. The technique of preparing and exhibiting objects so that these conditions are fulfilled constitutes *microscopy*. The requisite magnification is attained by the use of lenses or mirrors (see LENS; LIGHT), singly or in combination, the primary distinction being between *simple Ms.*, in which the image is erect and virtual, and *compound Ms.*, in which a real and inverted image is projected into the focal plane of an auxiliary lens system or on to a screen or photographic plate.

The following account is concerned solely with the compound M., which is to be preferred to the simple in all cases where manipulation of the specimen or extreme portability is not the primary consideration, owing to its greater power of resolving fine detail, and its practical convenience. The real image, moreover, can be subjected to measurement or optical analysis in a manner impossible with a virtual one. Compound Ms. may be divided into various types according to their action, which may be by refraction or reflection, and also according to the system of image formation employed, which may be *conventional* or by *phase difference*. The term *conventional* is here used to designate all systems which fulfil the classical requirement of equality between all light paths from a point in the object to the corresponding point in the image; in the phase difference system this condition is deliberately violated in order to secure interference effects that would not otherwise occur.

Image Formation.—An object is rendered essentially visible by virtue of the disturbance which it causes to light or other waves which it intercepts. The disturbance may be analysed into several distinct components, viz. absorption, reflection, refraction, diffraction, polarisation, and fluorescence, and these are used singly or in combination to secure the visibility of the magnified image of the object. The classical theory of M. image formation, due to Abbe, may be generally summarised in the statement that a ray of light impinging on an object is modified by diffraction into an assembly consisting of an undeviated ray and a set of others diverging from it at angles dependent on the magnitude of the diffracting structure relative to the wavelength of the light. Ideally all of these should be reunited in their original phase relationships in the image, which is formed by their mutual interference (see LIGHT). In practice, however, this is not completely possible, and the image differs from the object according to the extent to which the ideal relationship is unfulfilled. Experiments and calculations made in the nineteenth century proved that the direct and the diffracted rays arising from objects having the nature of a periodically opaque grating were either co-phased or in reversed phase, so that when reunited in the image they interfered to produce a pattern of varying intensities: it was not, however, until 1932 that it was discovered by Zernike that this is not the

case if the object is completely transparent, and varies in thickness or refractive index; it then yields diffracted rays which are substantially a quarter of a wavelength out of phase with the direct rays, and so do not interfere to produce a pattern of varying intensities, but one of varying phases, to which the eye is not sensitive. In the phase difference (or phase contrast) system these rays are artificially brought into a relationship in which interference produces an image of varying intensities.

Components of the Microscope.—Apart from the specimen, the essential optical elements of a M. are the projecting lens (objective, object glass) and the illuminating system, whilst in common use the real image projected by the objective is received by a lens system (eyepiece, ocular) which presents to the observer's eye a virtual image further amplified, and which thus functions as a simple M. The most important of these optical elements is the *objective*, upon which the resolving power and magnification depend. This normally consists of a system of lenses of glass, quartz, or fluorite, in suitable combination, designed to project an image having a minimum degree of aberration (see LENS) when the object and image lie in predetermined planes. As it is only possible to correct the lens for one such pair of planes, the image deteriorates if this condition is violated, and any divergence from the preselected conditions of observation must be compensated by a corresponding adjustment in the location of the image plane to restore equilibrium. The optical properties of the glasses used in construction do not permit all the spectral colours (see SPECTRUM) to be united in a perfectly corrected image; the common achromatic objectives are chromatically correct for two colours, but spherically for only one, whilst the more complex *apochromats* are chromatically corrected for three colours, and spherically for two, thus producing a more brilliant and sharper image than the former. Restriction of the illumination to approximately monochromatic conditions therefore improves the definition of the achromat, and for use in the ultra-violet region (see ULTRA-VIOLET LIGHT), where isolated spectral lines are used for illumination, objectives are spherically corrected for one wave-length only. The great advantage of the reflecting objective is that ideally it is free from chromatic aberration through the entire range of the ultra-violet, visual, and infra-red spectra, and its spherical correction is equally independent of wave-length. In the past the difficulties of shaping the non-spherical surfaces necessary have resulted in indifferent quality, but a new pattern constructed by Burch is found to compare favourably with the best refracting objectives. Its unique qualities lend themselves particularly to researches in microspectrometry.

The resolving power of an objective depends both on the wave-length of the illumination and the obliquity at which

the objective can accept the rays diffracted by the object. This feature is governed by the focal length and diameter of the lenses, and is measured by a factor known as the *numerical aperture* (N.A.), which in combination with the wavelength of the illumination defines the resolution possible; the minimum interval between separable points is commonly obtained from the formula

$$\text{Resolving Power} = \frac{\text{Wavelength}}{2 \times \text{N.A.}}$$

The N.A. of the system is limited in value to that of the lowest refractive index between the objective and the specimen, as the more oblique rays are lost by internal reflection. To avoid this the *homogeneous immersion* system is employed, which by the use of a suitable fluid filling the space between the objective and specimen, eliminates discrepancies of refractive index, and thus increases the possible resolving power of the system by 50 per cent; the need for tube-length variation to adjust the working conditions is also automatically obviated.

It is obviously important that the detail resolved should also be visible. To permit this it is generally stated that adjacent elements should subtend an angle of two minutes of arc at the eye, but this may be considered as a theoretical minimum based on the ultimate effort of a perfect eye. To ensure that this separation is attained, it is customary to recommend a magnification of about five hundred times the N.A., but in practice a great subtense is more convenient, and this figure can be increased by 100 per cent, or more in suitable circumstances, without deterioration of the image.

The influence of illumination on the image is profound, and a thorough appreciation of what it can be made to do is perhaps the most useful lesson that a microscopist can learn, as he will thereby analyse the image in terms of his experience instead of regarding it as an immutable representation of the object. The illuminating system consists essentially of a suitable light source, preferably of small area and high intensity, a lens or reflecting system (*substage condenser*) to produce an image of the light source in the plane of the object, and a diaphragm to regulate the obliquity and conformation of the illuminating rays. By the employment of a diaphragm of suitable aperture and shape the rays converging in the specimen may be made to utilise only selected portions of the objective aperture, with consequent modification of the image, and by the use of very oblique illumination the image may be constituted by diffracted rays alone, appearing luminous against a dark background. Substage condensers are usually of two patterns, one conforming to the general plan of an objective, and ideally, but very seldom, as well corrected, working either dry or in immersion contact with the specimen, and the other a reflecting system invariably immersed, and furnishing extremely oblique annular illumination. The first is employed at a

suitably regulated aperture to provide direct illumination of the specimen, and may be used for oblique or darkground lighting effects with objectives of medium power; the second furnishes darkground illumination for objectives of high aperture. Attainment of the full resolving power of the objective depends almost as much on the condenser as upon the objective itself, and it is extremely important that both components should be co-axial; the condenser should therefore be provided with means to centre it to the M. axis.

In visual use the image furnished by the objective is further amplified by an eyepiece, the two being mounted in a tube the length of which is adjustable to secure the optimum circumstances for image formation. The entire tube, and the condenser independently, can be moved axially, to focus the image and illuminant; the tube is usually, and the condenser occasionally, provided with a second extremely sensitive focusing action termed the *fine adjustment*, which is perhaps the most important mechanical feature of the instrument, and which is commonly graduated for use as a micrometer.

Eyepieces vary in construction according to their purpose, and several differing systems are employed. For normal visual use Huyghens' form is general, but many modern eyepieces are based on other formulae, and for use with apochromatic objectives, special correction is necessary. For photography the eyepiece is computed to project a real image, although negative lens systems unsuitable for direct vision can be employed for this purpose, or the eyepiece may be omitted altogether.

It is no longer possible to give any general description of the M. as an instrument, as specialised patterns differing widely in form and function are constructed for research in distinct fields. The ultimate resolution at present available is provided by the electron M., in which electro-magnetic fields focus beams of electrons in vacuo; the visible image is produced by fluorescence or photography, and the object usually prepared by the deposition of metallic vapour on to it. Resolution so far obtained is of the order of 0.005 microns (1 micron = 0.001 mm.), but the instrument, which is as yet in its infancy, is severely limited in application by the slight penetrating power of the radiation involved, and technical considerations that enforce a magnification measured in thousands of diameters. Protein molecules, virus and bacteriophage particles have been seen for the first time by the use of this instrument, which can also be used to measure them.

Of more general application, the ultra-violet M. likewise yields a photographic image, although in favourable cases a fluorescent eyepiece may be used with it. The resolving power is about 0.14 microns at a wave-length of 2753 Angstrom units, compared with a resolving power of 0.27 microns attainable by the visual spectrum. A special technique as well as special apparatus is

required for work in the extreme ultra-violet, but useful results are attained with the longer wave-lengths, owing to selective absorption by specific substances in the specimen, which enhance visibility. Fluorescence microscopy employs ultra-violet illumination of the object, visual light emanating from which forms a visible image; it can be used in the diagnosis of certain bacteria. Differential absorption is a marked feature of microscopy in the infra-red region, many substances having characteristic absorption spectra in that zone; as remarked earlier, the reflecting M. is particularly adapted to this work, which is of profound value in biochemistry and physiology.

Visual microscopy has lately been advanced by the phase contrast technique, which by the use of an interferometer arrangement renders slight differences of refractive index in the specimen as differences of brightness in the image. This has the result of allowing fresh unstained material to be examined living, and can reproduce in the image many of the effects hitherto attained only by staining. In conjunction with ciné-photography this permits the phenomena of growth, mitosis, etc., to be recorded and studied at more convenient speeds. The phase contrast system is still capable of great development, but is clearly an advance in microscopy comparable with any of the classic advances of the past.

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Microscopical Society, The Royal, was estab. in 1839 for the promotion of microscopical and biological science by the communication, discussion, and pub. of observations and discoveries relating to (1) improvements in the construction and mode of application of the microscope, and (2) biological and other subjects of microscopical research. It consists of ordinary, honorary, and ex-officio fellows of either sex. The jour. of the society is pub. quarterly from the offices of the society at Brit. Medical Association House, Tavistock Square, London, W.C.1.

Microscopium (the Microscope), S. constellation discovered in 1752 by Lacaille, situated N. of Grus and Indus at the junction of Capricornus and Sagittarius.

Microstys, genus of terrestrial orchids with handsome leaves, and small greenish-yellow or purple flowers.

Microtome, instrument adapted for cutting fine sections of material preparatory

to observation under the microscope. There are many varieties, but the essential part of the instrument is a device for leading an embedding block containing the material to a cutting instrument, or for leading the cutting instrument to the block by a sliding arrangement whose motion is exactly governed by graduated screws. A section with a uniform thickness of as little as .002 mm. can be cut. Some of the more expensive Ms. are to a high degree 'automatic.' In the Cambridge rocking M. the material is fixed in a tube containing paraffin, and moved to the cutting edge, the degree of movement being read on a graduated arc, to thousandths of a millimetre.

Microtus, s.v. ARVICOLA.

Midas, son of Gordius, and king of Phrygia, renowned for his immense riches. In consequence of his kind treatment of Silenus, the companion and teacher of Dionysus, the latter allowed M. to ask a favour of him. M. in his folly desired that all things which he touched should be changed into gold. The request was granted; but as even the food which he touched became gold, he implored the god to take his favour back. Dionysus accordingly ordered him to bathe in the sources of the Pactolus, near Mt. Tmolus. This bath saved M., but the riv. from that time had an abundance of gold in its sand. Once when Pan and Apollo were engaged in a musical contest on the flute and lyre, M. was chosen to decide between them. The king decided in favour of Pan, whereupon Apollo changed his ears into those of an ass. M. contrived to conceal them under his Phrygian cap, but the servant who used to cut his hair discovered them. The secret so much harassed the man that, as he could not betray it to a human being, he dug a hole in the earth, and whispered into it: 'King Midas has ass's ears.' He then filled up the hole, but on the same spot a reed grew, which in its whispers betrayed the secret.

Middelburg: 1. Cap. of the prov. of Zeeland, Netherlands, on the is. of Walcheren, 4 m. N. of Flushing. It has an old abbey dating from the thirteenth century. It was a Hanse tn., and its charter dates from 1225. In the Ger. bombing of Walcheren in 1940 the centre of the tn. of M. was completely flattened. Part of the destroyed portion was rebuilt during 1940-1941, before the Ger. occupation authorities put an end to civil building in order to concentrate all Dutch materials and labour on their defensive W. wall. Canadian and Brit. forces captured M. and its Ger. garrison on Nov. 9, 1941. Pop. 19,000. (See further under WESTERN FRONT IN SECOND WORLD WAR.) 2. Cap. of a dist. of the same name, in the Transvaal, S. Africa, on a trib. of the R. Olifant, 98 m. E. of Pretoria. Extensive coalfields are near. Pop. (Europeans) 3700. 3. Cap. of a div. of the same name, Cape Prov., S. Africa, 250 m. N. by W. of Port Elizabeth, in a fertile agric. dist. Pop. 6660 (European 3440).

Middens, Kitchen, see KITCHEN.

Middle Ages. The. Period known as the M. A. covers the thousand years from the

collapse of the Rom. Empire to the birth of the modern nation-state, A.D. 500 to A.D. 1500, and is the intermediate period between the culture of classical antiquity and the Renaissance. It was not, however, a homogeneous period. Until the eleventh century there was a formative age, which may appropriately be described as the Dark Ages. Much of Rom. civilisation was lost under the surge of Germanic invaders in N. Europe, Germany, and Italy, and the Moorish dominion in Spain. One link, a tradition of order, remained as an ideal in a welter of disorganisation and invasion. By the end of the eleventh century the ideal came nearer to practice as political organisation in W. Europe achieved a degree of stability sufficient to allow the growth of a civilisation which may be called medieval. The threat of Scandinavian and Moslem invasion was less immediate; international trade was growing; military techniques, with castle and knight, were effective.

Medieval knowledge of physical science was negligible, and education was conservative, but there was, in this civilisation, much of significance. Lat. was the international language, and it enabled the growth of cosmopolitan univs. and of a common fund of knowledge. The estab. of papal authority over the churches of the W. world created an international organisation more efficient than any which has appeared since the dissolution of the Rom. Empire. In political affairs the theory was held that Europe formed a supernational state, a Holy Rom. empire. Though never of any great significance in the ultimate political development of Europe, this ideal could be used as a rallying-point on occasions of general European concern; by it was raised the greatest of the crusades, in 1188, under the Emperor Frederick I. Throughout the M. A. the search for European unity was a recurrent theme. The twentieth century has seen a renewal of this theme, and with it a recognition of the brilliance of the contributions of such men as Thomas Aquinas, Dante, Chaucer, Froissart, Giotto, and Michael Angelo in the fields of philosophy, literature, and art, and of the enduring value of the architecture of the M. A. of which many noble examples are extant to-day.

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Middleborough, tn. and summer resort in Plymouth co., Massachusetts, U.S.A., 35 m. S.E. of Boston; has manuf. of shoes, woollens, iron goods, and tiles. Pop. 9000.

Middle Caraquet, tn. in Gloucester co., New Brunswick, Canada, 12 m. W.N.W. of Shippagan. Its chief industries are flour, lumber, and canneries. Pop. 6000.

Middle Congo (Moyen-Congo), colony of Fr. Equatorial Africa. With an area of 166,069 sq. m., it extends to the E. of the Gabon (Gabun) ter. up to the Congo and to the lower course of the Congo's great trib., the Ubangi. It is watered by the Rs. Sanga, Alima, and the two Likoualas. S. of the Congo it embraces the basin of the R. Kouilou-Niari, which gives the colony a sea-front, but does not give the hinterland any natural outlet to the sea. Shallow, broken by rapids, it is navigable only up to 80 km. for boats of shallow draught, while a dangerous sand-bar obstructs easy communication between riv.-boats and the sea. Some 50 m. from the coast the mt. and forest massif of the Mayumbé, an extension of the Monts de Cristal, offers a serious hindrance to the estab. of communications with the interior. Brazzaville, cap. of the M. C., and seat of the governor-general of Fr. Equatorial Africa, is built on the r. b. of Stanley Pool, 400 km. from the sea opposite the Belgian tns. of Léopoldville and Kinshassa. Thanks to the splendid riv. network of the Congo, Brazzaville has easy communication with the hinterland; but its ocean communications are precarious, and depend on the trib.s. of the Belgian Congo. Its main port, Pointe Noire, is accessible to large ships, and has been entirely modernised since 1935. The surface of the M. C. is partly extensive forest land and partly grassy savannahs. It is a country of palm-oil, rubber, copal, ivory, and raffia. Copper is mined in the Monts de Cristal, especially at Mindouli. Pop. 629,600.

Middle East, term loosely used to embrace the various countries in N. and N.E. Africa, countries and is. in the E. Mediterranean, and the various Arab states, together with Persia and Asia Minor. Strictly the term includes only the Turkish succession states or countries, i.e. the countries over which the Turks were suzerains before the First World War, viz., Palestine, Syria, Transjordan, Hejaz, Nejd, and Egypt, all of which countries, together with the Balkans, were previously comprised under the term 'Near E.' The term 'M. E.' was coined by the Cairo Conference (which was held under Mr. Winston Churchill in 1921) in order to differentiate the political questions involved in these Arab states and Egypt from the quite unrelated questions, such

as the ever-recurring Dardanelles problems, and the conflicting views of Turkey and the other Balkan States concerning the Balkans generally, and thus the term 'Near E.' became restricted to the Balkans. During the Second World War, however, the term 'M. E.' soon took on a much wider significance both politically and in a military sense. All the countries included in the M. E., whether actually involved in campaigns or not, were of great strategic importance to the United Nations in the Second World War but, above all, to Great Britain in the protection of India and the Persian oilfields from attack from the W. A minister of state in the M. E. was appointed in June 1941, to represent the War Cabinet, charged with the duty of concerting measures necessary for the prosecution of the war in that part of the world, other than the conduct of military operations, and thereby relieving the military commander of many responsibilities unrelated to the actual military operations. Mr. Oliver Lyttelton (later minister of production) was the first occupant of the post, and Mr. Casey, Australian minister, succeeded him. A M. E. supply centre was set up in Cairo in April 1941, when the difficulties which arose over supplying Greece during the Greco-It. war had demonstrated the need for organising civil supplies for other territories, forming the allied base of operations in N.E. Africa and S.W. Asia. Later this body served a pop. of some 80,000,000, including in its scope Egypt, the Sudan, Palestine, Transjordan, Saudi Arabia, Eritrea, Brit. Somaliland, Syria and Lebanon, Iraq, Persia (Iran), and, for certain purposes, Turkey and Malta. The centre carried out its administrative work under the direction of the minister of state. Originally a purely Brit. agency, the centre developed into an Anglo-Amer. body by the addition of U.S. civil and military representatives. There were many notable campaigns in M. E. countries, particularly the Ger. conquest of Crete (May-June 1941); the battle of the W. Desert (Nov. 1940-Feb. 1941), in which Gen. Wavell routed Gen. Graziani's forces; the conquest of It. E. Africa, including Ethiopia (Feb. 1941-Nov. 1941) by Gens. Cunningham and Platt; the Axis (q.v.) offensive under Marshal Rommel in 1942 which was eventually stopped on the line El Alamein-Qattara; and Gen. Alexander and Gen. Montgomery's victory over Rommel in Oct.-Nov. 1942. Syria was conquered by Brit. forces in June 1941. Axis plotting in Iraq was checked by the Brit. counter measures in April-May 1941, and Persia was occupied in Aug. 1941. See further under AFRICA, NORTH, SECOND WORLD WAR CAMPAIGNS IN; CRETE, BATTLE OF (1941); IRAQ, RECOLL. IN; ITALIAN EAST AFRICA, SECOND WORLD WAR CAMPAIGN IN (1941); PERSIA, ANGLO-SOVIET INVASION (1941); SYRIA, BRITISH INVASION (1941). The location of R.A.F. bases in Sinai, Transjordan (the Hashimite Kingdom of Jordan), Kharjoun, and Iraq, and of U.S.S.R. bases in the Caucasus and Turkestan, the oilfields and pipe-lines in

Iraq and Persia, and the shipping routes to the M. E. all combine to give that region its vital importance in world strategy. The unsettled conflict between the Arab states and Israel, particularly over the Arab refugee question, the growing disunity among the Arab states themselves, and the unsatisfactory state of Brit. relations with many M. E. countries bad, by 1949, severely upset the stability and security of the M. E. Brit. policy after the Second World War was, and remains, one of non-interference; for, until the refugee question is disposed of, there is little that can be done to provide the M. E. with the breathing space and the renewed hope which it needs if it is not to relapse into anarchy. The negotiations of June 1949 of the Conciliation Commission of the United Nations reached deadlock largely because of the refusal of Israel to take back any Arab refugees until Palestinian frontiers had been settled. At the moment there are about 900,000 Arabs in receipt of relief, 800,000 being refugees; and of these refugees 600,000 come from within Israel and 200,000 from outside that state. From the long-term point of view the refugees provide the greatest opportunity for a constructive reshaping of Brit. policy towards the M. E. They represent a much greater problem than the Arab states themselves can solve. What seems to be wanted is some large-scale development project which would at the same time provide the refugees with work and the country concerned with a prospective increase in its real wealth. The project would require wide autonomous powers, which would involve receiving concessionary rights over local resources such as those enjoyed by the oil companies. It would, if successful, provide a concrete example of W. skill diverted to a benevolent end, and to the extent that it became integrated with the general economy of the M. E. it would have a stabilising influence over it. See G. E. Kirk, *A Short History of the Middle East*, 1948.

Middle English, see ENGLISH LANGUAGE; ENGLISH LITERATURE.

Middleham, small tn. in the N. Riding of Yorkshire, England, on the R. Ure. It has the ruins of the castle of the Nevilles, lords of Raby.

Middle Latitude, in navigation, the mean of two lats. It is the distinctive name of a method called in navigation M. L. sailing, which means that, in estimating the difference of long. by means of the differences of lat., and the intermediate departure, this departure is supposed to be an arc of a parallel of long. at the intermediate or M. L. (see Riddle's *Naviga-tion*, in which a table may be found corrective of the results).

Middle Oil, name given to one of the fractions obtained in the distillation of coal tar. The products obtained from it are naphthalene and carbolic acid.

Middle Park Plate, see RACE MEETINGS.

Middlesbrough, city in Bell co. Kentucky, U.S.A., 64 m. N.E. of Knoxville, Tennessee. It has coal and iron mining, and manufis. of steel and brick. Pop. 10,000.

Middlesbrough, manufacturing and iron and steel producing tn., situated at the mouth of the R. Tees in the N. Riding of Yorkshire, England, 238 m. from London. It is a municipal co. and parl. bor., incorporated in 1853; its boundaries were extended in 1913 and 1932, its pop. now being approximately 144,000. M. returns two members to Parliament. By Order in Council dated Aug. 5, 1948 the number of wards of the tn. was increased from eleven to seventeen, and accordingly the tn. council consists of seventeen aldermen and fifty-one councillors. The highly industrialised Tees-side area of which M. is the centre is the biggest producer of pig iron in the country. Within the tn. there are constructional works, chemical plants, and numerous engineering and allied industries. M. is within a development area and the Board of Trade have erected a number of modern factories for light industries. The corporation propose to supplement this development by sponsoring the relocation of light industry, sites for which must be found to afford facilities for industries displaced from other areas in the tn. which need replanning and redevelopment under the corporation's master plan for the control of future development. The heavy industries, shipyards, docks, and wharves are on the banks of the riv., and the tn., which is of comparatively recent growth, spreads southward towards the Cleveland Hills. Gas for industrial and domestic use is supplied by the corporation, and a plentiful supply of water for industrial and domestic consumers is provided by the Tees Valley Water Board, of which the corporation is the largest constituent authority. Transport facilities by road and sea are excellent. The R. Tees is spanned by a transporter bridge and a vertical lift bridge, both of which are almost without equal in the United Kingdom, but necessitated by the low-lying nature of the land on either bank. The corporation has erected more than 5000 houses on four built-up housing estates and two rapidly developing additional estates.

The tn. has two very fine natural parks, one artificial park, and sev. recreation grounds. There are two theatres and a flourishing Little Theatre catering for amateur dramatic talent. There is easy and ready access to the sea and to moor and country, all within a radius of 10 m. The tn. has a well-equipped technical college, grammar and secondary modern schools, public baths, libraries, museum, art gallery, hospital, mental hospital, and sanatorium, and one of the cheapest public omnibus transport systems in the country. Large-scale industrial developments are contemplated and in hand immediately to the E. of the tn., consisting of the construction of a huge steel-processing plant and chemical works. The Tees Conservancy Commissioners are providing considerable dock and riv. improvements to supplement the deep-water wharves, and the Brit. Railways docks which cope with ships of up to 13,000 tons.

The first attack in the Second World

War by the Ger. Air Force on an industrial target in England was directed against M. on May 25, 1940, and was followed during the course of the war by a further eleven attacks in which bombs fell on the industrial and built-up area. In the raids 78 persons were killed and 594 injured, 318 buildings were totally destroyed and 8547 damaged. St. Peter's church and vicarage were totally destroyed. See Ruth Glass (ed.), *The Social Background of a Plan: a Study of Middlesbrough*, 1948.

and sev. modern light industries. M. consists of two co. constituencies and twenty-six bor. constituencies, each returning one member to Parliament. Pop. 1,958,000. See M. Sharpe, *The Antiquities of Middlesex*, 1911; W. Page (ed.), *Victoria County History*, 1911; and A. Mee (ed.), *Middlesex*, 1940.

Middlesex Regiment, traces its hist. to the 59th and 77th regiments of Foot. The 59th Foot was raised in the W. country by Col. Arabin in 1755 for service in the Seven



W. Haig Parry

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MIDDLESBROUGH: THE TEES TRANSPORTER BRIDGE

Total length of the bridge and approach span, from end to end, is 850 feet, the span across the water between the towers 570 feet, and the height from the high-water mark to the underside of the girders over the river 160 feet.

Middlesex, metropolitan co. of England, has an area of 233 sq. m. M. is separated from Surrey and Kent on the S. by the Thames, between Staines and Chiswick Eyot; from Essex on the E. by the R. Lea, from Waltham Abbey to Stamford Hill; from the co. of London by a line drawn N. from Chiswick Eyot to Willesden Junction, E. to Kilburn, N. to Shoot-up Hill, E. round the N. fronts of Hampstead and Crouch Hills, round the S. to Finchley Park, and again E. to Stamford Hill, thence to the R. Lea; the div. from Buckinghamshire on the W. is the R. Colne, from Rickmansworth to Staines, and from Hertfordshire on the N. an irregular arbitrary boundary running E. from Rickmansworth to Barnet, N. to Mimms Wood, and then E. to the Stort and Lea navigation to Waltham. The co. is intersected by the New R. and the Paddington and Grand Junction canals. The co. tn. is Brentford. Save for a small and diminishing rural area in the W., M. is covered with tns. and urb. dists., suburbs of London. There is a small-arms factory at Enfield, gov. powder mills at Hounslow,

Years war and, two years later, it was renumbered the 57th Foot, and then, during the Amer. war, 1775, it received its second title, the W. M. R., though most of its personnel were men of Scots birth. The 77th Foot was raised by Col. James Marsh in 1787, and in 1807 was given the title of E. M. R. Formed to augment the army in India, the cost being borne by the E. India Company, it took part in the siege and capture of Seringapatam, then reputed the strongest fortress in India. In a later assault on the same fortress Lt. John Lawrence, of the regiment, was wounded, and left for dead, but survived to become the father of Sir Harry Lawrence and Lord Lawrence, two of India's most distinguished soldiers. The Peninsular war added many battle honours to those of the M. R.: the 57th's first experience of a great battle with Napoleon's veterans was at Albuera, where they earned the sobriquet of 'the Diehards' from the fact that their commanding officer, Col. Inglis, though terribly wounded, continued till the end of the fight to rally his men with the repeated

call 'Die hard, 57th, die hard.' In the siege and capture of Badajoz, in which Picton's div. was so prominent, the 77th, which was part of that div., was reduced to 100 men in all. Subsequently both the 57th and 77th regiments were sent to the Crimea, and fought under the duke of Cambridge. The 77th received the surrender of Balaclava, and both regiments fought at Inkermann, and took part in the siege of Sebastopol. Later, in New Zealand, the 59th gained distinction for the courageous way in which it attacked the Maori stockades in the Maori war of 1860. In 1881 the two regiments, 57th and 77th, which had for some time been linked for the purpose of providing drafts, became permanently incorporated as the 1st and 2nd battalions of the Duke of Cambridge's Own (M. R.). In the S. African war the 2nd battalion fought at Spion Kop, Vaal Krantz, Colenso, and Pieter's Hill. The 3rd and 4th regular battalions were raised early in this war. All four regular battalions went to the W. Front in the First World War. Mons, Le Cateau, the Marne, the Aisne, the first battle of Ypres, Loos, the second battle of Ypres, the second battle of Loos, the third battle of Ypres, the Somme, Arras, Messines, Passchendaele, Cambrai (1917), Cambrai (1918). Mons (1918) were all battles in which the regiment was heavily engaged. Other battalions raised as new or territorial army units, took part in battles in Salonika, Egypt, Gallipoli, Palestine, Mesopotamia, and the advance into Bulgaria, as well as in Turkey, Siberia, and India. Before the war ended there were as many as forty-one battalions of the regiment serving at home or overseas. The M. R. fought in N.W. Europe and in Italy in the Second World War. In the battle of Normandy, 1944, they were associated with the Argyll and Sutherland Highlanders in the tremendous struggle to hold the second crossing over the R. Orne.

Middle Temple, see INNS OF COURT.

Middleton, Conyers (1683–1750), Eng. divine, b. at Richmond in Yorkshire, or at York itself. He was a fierce and bitter controversialist, and among his best-known pamphlets are *A Letter from Rome* (1729); and *An Inquiry into Miracles* (1748). He anticipated the method of historical criticism applied to the O.T. stories. He pub. an interesting and valuable *Life of Marcus Tullius Cicero* (1741), largely plagiarised, however, from Wm. Belhaven (q.v.), a seventeenth-century Scottish writer.

Middleton, or Myddelton, Sir Hugh (c. 1560–1631), Eng. engineer, b. at Denbigh, N. Wales. In 1606 he made an offer to Parliament to bring drinking water, of which there was a great scarcity, to London. In 1609 the first sod upon the works of the New R. (q.v.) was turned, and in 1613, in spite of strenuous opposition from the landowners and financial difficulty, the work was completed, largely owing to the financial support received from the king. The original New R. drew its water from chalk springs at Chadwell near Amwell, and after a

course of 38*½* m. entered a reservoir at Islington.

Middleton, Thomas (c. 1570–1627), Eng. dramatist, of whose early life little is known. He was b. in London, and the inference from his plays and pamphlets is that he was a man of breeding and a good classical scholar. He was entered a student at Gray's Inn, and evidently used his legal knowledge in *The Old Law*, a play written about 1599 in collaboration with Wm. Rowley (produced 1656), and in *Michelmas Term* (produced 1607). He wrote plays by himself and also in collaboration with Drayton, Webster, Munday, Dekker, and Rowley and, besides plays, composed many pageants and masques. The first play written by himself was *The Chester Tragedy* (1602), from which year he wrote regularly for the theatre. He was at his best when writing comedies of manners, his satire being keen and his dialogue excellent. One of his plays, *A Game at Chess* (1624) achieved the distinction of being objected to by the Sp. ambassador on political grounds; the leading politicians of England and Spain appeared under the names and guises of chequers, and the play was most successful. In later years he wrote pamphlets and composed pageants for civic ceremonials and prepared masques. He was appointed city chronologer in 1620, in which capacity he composed a chronicle of the city, now lost. His chief plays, many posthumously produced, are *A Trick to catch the Old One* (1608); *The Familiie of Love* (1608); *A Mad World, my Masters* (1608), one of his best plays; *A Faire Quarrel* (1617); *A Chaste Maid in Cheapside* (1630); *Women beware Women* (1637); *No Wit, No Help like a Woman* (1637); *More Dissemblers besides Women* (1637); and *The Witch* (1778). In collaboration with other playwrights are: with Dekker, *The Roaring Girl* (1611); with Ben Jonson, *The Widow* (1652); with Rowley, *The Spanish Gipsy* (1653); and *The Changeling* (1653). The outstanding characteristics of his comedies, some of which are highly praised by Lamb, are the wide observation of men and manners, and the boldness of treatment. His tragedies rival those of Webster in scenes of strong passion. He is, however, unequal as a dramatist, and repeats himself. In many we have types as old as those in Plautus: misers, courtesans, and spendthrifts, but reanimated with M.'s vigour and wit. M. obviously knew the life of the people, and was a good 'mixer.' This is manifest from his pamphlets *The Black Book* (1604) and *Father Hubbard's Tales* (1604), which show no small acquaintance with the haunts and habits of pimps, bullies, Cyprians, and thieves. His general outlook was that of typical cultivated Englishman, with no love for the Puritans and no extremes of party feeling. Among his pageants and masques are *The Triumphs of Truth* (1613); *The Triumphs of Honour and Industry* (1617); and *The Inner Temple Masque* (1619), etc. His works were collected by Dyce in 1840 and by A. H. Bullen, 1885–86. See R. Withington, *English Pageantry*, 1918–20; W. D. Dunkel,

The Dramatic Technique of Thomas Middleton in his Comedies of London Life, 1925; and M. C. Bradbrook, *Themes and Conventions of Elizabethan Tragedy, 1935.*

Middleton, municipal bor. of Lancashire, England, 5 m. N.E. from Manchester. It is an important seat of the cotton and silk manufs. Soap and chemicals are made, and calico printing is carried on. There are coal mines and iron works. Pop. 29,100.

Middleton, or Midleton, mrkt. tn. of Eire, in the co. of and 13 m. E. of Cork, has a whisky distillery and flour-mills. Pop. 3500.

22 m. S.W. of Durham, England, on the R. Tees; it has lead mines. Pop. 2300.

Middle West, The, term rather loosely applied in the U.S.A., as much to a geographical section as to an attitude of mind in politics and economics. At various times the states of Ohio, Indiana, Illinois, Michigan, Iowa, Wisconsin, Minnesota, N. and S. Dakota, Kansas, and Nebraska have been termed middle W. states. Though some of these have considerable industrial cities, in the main they are all alike in being principally agric. states, with flat plains or prairie soil and well watered. The characteristic frame



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CRAWFORDSVILLE, INDIANA: A TOWN OF THE MIDDLE WEST

A town laid out in 1823 by Major Ambrose Whitlock, who named it in honour of Colonel William Crawford of Virginia, a famous Indian fighter. It is a busy manufacturing and trading city, its residential area, seen in the photograph, being surrounded by a productive agricultural area.

Middleton: 1. City and the co. seat of Middlesex co., Connecticut, U.S.A., on the Connecticut R., 16 m. S. of Hartford. It is the seat of a Wesleyan univ., and has manufs. of cotton, pumps, hydraulic machinery, typewriters, and rubber fabrics. Pop. 26,400. 2. City in Orange co., New York, U.S.A., 57 m. N.W. of New York city, in a rich agric. dist. Manufs. include straw hats, hardware, cigars, machine tools, and fur and leather goods. Pop. 21,900. 3. City in Butler co., Ohio, U.S.A., on the Miami R., 35 m. N. of Cincinnati, with manufs. of tobacco, paper, bicycles, steel, and agric. instruments. Pop. 31,200. 4. Tn. in Dauphin co., Pennsylvania, U.S.A., on the Susquehanna R., 9 m. S.E. of Harrisburg; has flour and planing mills, and iron manufs. Pop. 7000.

Middleton-in-Teesdale, tn. in the co. and

of mind of the farmers, who make up the bulk of the pop., is explained by the fact that, while they raise most of the food of the nation, the money control lies principally in New York, Boston, and Philadelphia. In hard times the farmers are compelled to file mortgages on their farms. These mortgages find their way to the banks, and the banks are controlled by the money situation in the E. Hence the bitter hatred often manifested towards Wall Street, the financial section of New York city. Politically most of these states are nominally Republican, but actually they have often inclined strongly to that type of Republicanism which is termed progressiv. As a revolt against the gold standard and Wall Street control, the farmers and small tn. folk of many of the middle W. states in the famous campaign of 1896 followed W. J. Bryan (q.v.),

Democratic nominee for president on a free silver platform. In later days their prophet was the late R. M. La Follette (*q.v.*), governor of, and afterwards U.S. senator from, Wisconsin, and a progressive and radical Republican always. In the mid-war campaign of 1916, when Woodrow Wilson was running for re-election as president, on the platform 'He kept us out of the war,' many of these middle W. states voted for him, notwithstanding that he was a Democrat. The type of mind so often satisfied in the novels of Sinclair Lewis is primarily the middle W. mind. The people are ardently Amer., very much averse from mixing in European affairs, intensely religious, devoted to the public-school (which in America means private-school) system and suspicious of anything that has to do with high finance and big business. It was the M. W. which largely opposed America's entry into the League of Nations and which later opposed cancellation of war debts. It is the M. W., too, which has most persistently demanded relief for the farmers in every crisis brought about by low world prices. A typical M. W. tn. has been described under the pseudonym of Middleton by R. S. and H. M. Lynd. See *Middleton* (1929) and *Middleton in Transition* (1937 and 1947).

Middlewich, m.rkt. tn. in Cheshire, England, 21 m. E. of Chester. There are chemical works and a condensed milk factory. Sait is produced. Pop. 7000.

Middleton, Yorkshire, see MIDDLETON.

Midgard, name given in Norse mythology to the earth as intermediate between the Asgard (*q.v.*) of the gods and Utgard of the Jötuns (*q.v.*).

Midges are small dipterous insects (tribe *Nematoptera*). They differ from the gnats or mosquitoes in the absence of their long, slender, horny proboscis. Most of them are quite harmless, but the females of some minute species of the genus *Ceratopogon* have the mouth highly developed, and with pointed lancet-like organs are able to draw blood. A typical M. is *Chironomus plumosus*, the aquatic larva of which is the blood worm. Many of the gall M. (Cecidomyidae), including the tessian fly and the wheat M., are serious plant pests.

Midhat Pasha (1822-84), Turkish statesman, b. in Constantinople. His first important mission was to subdue the brigandage in Rumelia; on returning he was promoted to the supreme council, and then made governor of Bulgaria. In 1860 he was made pasha. He visited sev. of the caps. of Europe, and then returned to frame the laws of the vilayets. In 1864 he was made governor of the vilayet of the Danube, and endeavoured to reconcile the Bulgarians to the Ottoman supremacy. He was twice grand vizier, under Abdul Aziz (1871), and again under Abdul Hamid II. (1877).

Midhurst, m.rkt. tn. of Sussex, England, on the Rother, 11 m. N.E. of Chichester. It has a grammar school (1672), Cowdray Castle, and the King Edward VII. sanatorium. Pop. of rural dist. 20,100.

Midi, region of France, comprising broadly the area between the bay of

Biscay and the Mediterranean, with Toulouse as the chief tn. Its name is due to the fact that it was once a middle land between France and Spain.

Midi, Canal du, or **Canal de Languedoc**, canal of France, connecting the Garonne with the Mediterranean. Length 150 m.

Midi, Dent du, mt. of the Alps, S. of Lake Geneva, between the Swiss valleys of Chambéry (N.W.) and Sallvan (S.E.). It was first ascended in 1784 by Clément, curé of Chambéry. Height, 10,696 ft.

Midi, Pic du, peak of the Pyrenees, S. France, 6 m. S. of Bagnères-de-Bigorre, almost on the Sp. frontier. The solar corona was first photographed in full sunlight from the observatory near its summit, in 1931. Altitude 9465 ft.

Midianites, Arab race, descended, according to Gen. xxv. 2, from Midian, the son of Abraham, and his Arab wife, Keturah. They occupied the land to the S. of Moab and Edom. Joseph was sold to Midianite merchants (Gen. xxvii.). Jethro, priest of Midian, was the father-in-law of Moses (Exod. iii.). The M. frequently united with Moab against the Israelites (Num. xxii.). They were crushed by Gideon (Judges vi.-viii.). Their national god was Baal-Peor. See also KENITES. See Sir R. Burton, *Midian Revisited*, 1879.

Midland Bank, The, was founded in Birmingham in 1836. The original title was the Birmingham and Midland Bank, and the paid-up cap. was £28,000. The bank followed the traditional lines of British banking throughout the first half-century of its career, but from 1888 onwards the policies of amalgamation and branch extension were adopted and vigorously pursued. In 1891, the Central Bank of London was absorbed, and this provided an estab. in the metropolis with a seat in the London Bankers' Clearing-House. The City Bank was absorbed in 1898, and in 1918 the largest amalgamation, that with the London Joint Stock Bank, took place. Besides the smaller banks in England and Wales which the M. B. had taken over, it acquired in 1917 the capital of the Belfast Banking Corporation, with its branches and agencies throughout N. Ireland. Similarly the capitals of the Clydesdale (1920) and N. of Scotland (1924) Banks were acquired. Each of these institutions, however, preserves its autonomy. The subscribed capital is £42,414,872, and paid-up capital, £15,158,621, and a reserve fund of equal amount. Its combined resources exceed £500,000,000.

Midland Dialect, see under ENGLISH LANGUAGE, *Middle English*.

Midlands, name denoting the midland cos. of England. The region lies between the Thames and the Trent and between E. Anglia and the cos. on the Welsh border. It includes the cos. of Derby, Leicester, Northampton, Nottingham, Rutland, Stafford, Warwick, and Worcester. See also ENGLAND AND WALES. See W. G. Hoskins, *Midland England*, 1949.

Midland Railway of England, The, estab. in 1844, was an amalgamation of the N. Midland, Midland and Cos., Birmingham and Derby, and other lines. In 1868 the system was extended from Bedford to

London, the Midland trains having previously reached London from Hitchin on the Great N. lines. The main line ran from St. Pancras (London terminus) to Carlisle, serving the prin. tns. of the Midlands, W. Riding, and Manchester. There was also an Irish section, the Belfast and N. Cos. system having been acquired in 1903. It had large docks at Heysham, Lancashire, for the cross-channel service between England, Belfast, and the Isle of Man, which became the property of the L.M.S., into which group the M. R. subsequently merged. Under the present system of Brit. Railways, the London Midland Region corresponds to the system of the former L.M.S.R. in England and Wales, with headquarters at Euston, London. *See further under LONDON, MIDLAND AND SCOTTISH RAILWAY COMPANY.*

Midleton, William St. John Fremantle Brodrick (1856-1942), first Earl and ninth Viscount, Eng. statesman; son of the eighth viscount, educated at Eton and Balliol College, Oxford. He held the offices of financial secretary to the War Office, 1896-92; under-secretary of state for war, 1895-98; under-secretary of state for foreign affairs, 1898-1900; secretary of state for war, 1900-3; secretary of state for India, 1903-5. He was prominent in Unionist politics in S. Ireland, being a landowner in Cork, and he favoured home rule for Ireland subject to safeguards for loyalists. He succeeded his father in the viscountcy, 1907; was a member of the Irish Convention, 1917-18; and was created earl of Midleton and Viscount Dunsford, 1920. His book *Ireland, Dupe or Heroine*, appeared in 1932. His autobiography, *Records and Recollections, 1856-1939*, was pub. in 1939.

Midlothian, or Edinburghshire, co. of Scotland, bounded on the N. by the firth of Forth, on the W. by Linlithgowshire, on the E. by Haddingtonshire and Berwickshire, and on the S. by Lanarkshire, Peeblesshire, and Selkirkshire. In the S.E. and S.W. parts of the co. are the Moorfoot Hills and the Pentland Hills, the latter of which extend to within 4 m. of Edinburgh; the chief summits are Blackhope Scar, highest point of the Moorfoot Hills (2136 ft.), Scalp Law (1898 ft.) and Carnethy (1881 ft.). Of the rvs. the Gala flows S. to the Tweed, and the Tyne, after a course of only 7 m. in the co., flows into Haddingtonshire; the N. and S. Esk Rvs., and the water of Leith, all flow into the firth of Forth. Half of the country consists of arable and pasture land; the most fertile part is the lowlands which stretch to the Forth. Many large farms are worked here on up-to-date methods, and dairy farming is extensively carried on in the hillier dists. The chief crops are oats, barley, turnips, and potatoes; horse-breeding is also a considerable industry. Coal is mined in the N.E. and S.E. parts, ironstone is found at Lasswade and Penicuik, and other minerals are limestone and freestone. The chief industry is paper-making, and the ales of the co. have long been famous. Other manufs. are whisky and gunpowder, whilst the fisheries are

valuable. The chief tns. of the co. are Edinburgh, Leith, Dalkeith, Musselburgh, and Portobello. Area 234,339 ac. Midlothian and Peebles send one member to Parliament. Pop. 526,200.

Midnapur, or Midnapore, cap. of a dist. of the same name in the Bardwan (or Burdwan) div. of Bengal, India, on the Kasai R. The trade is largely in indigo, silk, and brass and copper ware; rice is the chief agric. product. Pop. 40,000.

Midnight Sun. At the summer solstice, about June 21, the sun does not set, but sinks to the N. point of the horizon at midnight at the Arctic circle. At N. Cape in Norway it is visible at midnight from May 12 to June 29. This phenomenon is called the M. S., and the N.W. coast of Norway the 'land of the M. S.' Owing to the inclination of the rotational axis of the earth from the normal to the orbit, the sun is constantly visible during the summer at and within the Arctic and Antarctic circles for a period of forty-eight hours to six months, according to distance from the poles.

Midrash, oldest Heb. exposition of the O.T. which, for 1500 years after the exile, accumulated from the explanations of scriptural passages and became the basis of rabbinical teaching. It was divided into the *Halachah*, which dealt with civil and religious law and ordinances, and the *Haggadah*, the whole body of the narrative of the O.T.; to this latter part the term M. is usually confined. *See Steinschneider, Jewish Literature, 1857.*

Midriff, *see DIAPHRAGM.*

Midshipmen. On going to sea from the officers' training estab., naval cadets are promoted to the rank of midshipman, in which they have to serve for sixteen months before being commissioned as sub-lieutenant (*see RANK AND NAVAL EDUCATION*). During this period they undergo intensive practical training as well as a certain amount of theoretical study. They are placed in charge of boats, work under the officer of the watch, are attached to specialist officers for different periods, and take minor positions of responsibility in manning the ship's armament. Cruisers and above carry their quota of M., which in a battleship may be as many as thirty, but they all do time in destroyers and a period is also set aside for training in naval aviation.

Midsomer Norton, par. 9 m. S.W. of Bath, Somersetshire, England. Near by is the Benedictine abbey and school of St. Gregory at Stratton-on-Fosse. In the tower of its church, St. John the Baptist, are three bells presented by Charles II. There is trade in coal from the small Somerset coalfield. Pop. (1931) 8000.

Midsummer Day, June 24, the summer solstice, and one of the four Eng. term days. It is also St. John the Baptist's Day. *See JOHN'S, EVE OF ST., or MIDSUMMER EVE.*

Midsummer Eve, *see JOHN'S, EVE OF ST., or MIDSUMMER EVE.*

Midway Island, Battle of, *see NAVAL OPERATIONS IN SECOND WORLD WAR.*

Midway Islands, group of small is. in lat. 28° 13' N., and long. 177° 23' W.,

lying N.W. of the Sandwich group and forming the W. is. of the Amer. Hawaiian group. They consist of an atoll on which are two small is., Sand Is. and Eastern Is., and a number of islets. They were discovered by Capt. Brooks of the *Gambia* in 1859, who took possession of them in the name of the U.S.A. The barrier reef here is almost continuous except for a 3-m. gap on the W. side. In the S. part of the gap is Seward Roads, opposite the passage into Welles Harbour inside the lagoon. With a smooth sea there is a boat passage through the reef westward of Eastern Is. Sand Is. is composed of white coral sand; on its N. side are cable and wireless station buildings and a lighthouse. Eastern Is. is covered with trees, shrubs, and coarse grass, and has a sand beach of dazzling whiteness, except in its E. point, which is coral rock. The Is. were made an Amer. reservation in 1903. An Amer. naval victory over the Jap. was fought off the group in June 1942. See further under SECOND WORLD WAR, Naval Operations.

Midwifery (from A.-S. *mid*, with, and *wif*, woman, properly the woman or wife with or attendant upon a woman in childbirth) deals with care of women in childbirth. M. existed among the Israelites, and among the ant. Gks. It reached a high state of excellence. In the Middle Ages the science of M. fell into decay, but in the sixteenth century sev. works were pub. enumerating the general principles. As a strict branch of medical science, M. dates from the early eighteenth century, previous to that the matter being left as strictly a woman's province. To-day the supervision of midwives by the State is very thorough, and training and certificates are essential to all who practise M. The Midwives Act of 1902 regulated the craft, and gave power to the local authorities to exercise the necessary control over the M. of their dists. The central board has the right to delete names from the register of those who do not satisfy the regulations. See also OBSTETRICS.

Miechowitz, tn. in Polish Silesia, 3 m. W. by N. of Bytom (Beuthen). It has deposits of zinc and iron. Pop. 10,000.

Mier, tn. in the state of Tamaulipas, Mexico, on the Rio Grande del Norte, 80 m. E.N.E. of Monterey. Pop. 9000.

Mieres, tn. in Spain, in the prov. of and 9 m. S.E. of the city of Oviedo. It has coal, sulphur, copper, and cinnabar mines, chemical factories, steel and zinc works, and blast furnaces. Pop. 53,000.

Miereveld, Michiel Janszoon van (1567-1641), Dutch painter, b. and d. at Delft. He studied under the engraver Jerome Wierix and the painter Blocklandt. He produced an enormous number of careful portraits and a few interiors.

Mieris, Frans van (1635-81), called the elder, Dutch painter, b. at Delft. He studied under Gerard Douw. His works are mainly portraits and domestic scenes, and he especially favoured the portrayal of the life of the wealthy. One of his best pictures is 'The Cavalier and Lacemaker'

(1656) in the Viennese gallery. There are many panels by him in the Rühl collection in Cologne.

Mieris, Frans van (1689-1763), the younger, the son of Willem, and also a genre painter; but he is better known as an antiquary and historian. He pub. *Historie der nederlandsche Vorsten* (1732-35), and *Groot charterboek der graven van Holland, van Zeeland en heren van Friesland* (1753-56).

Mieris, Willem van (1662-1747), b. at Leyden, son of Frans the elder, was a genre painter like his father, whose pupil he was, but his work is inferior.

Miers, Sir Henry Alexander (1858-1942), Brit. mineralogist. B. in Rio de Janeiro, he was educated at Eton, and Trinity College, Oxford. In Brit. Museum 1882-95 he was engaged in research in crystal morphology. Appointed first Waynforth prof. of mineralogy, at Oxford, 1895; in 1908 he became principal of the univ. of London, and vice-chancellor of Manchester Univ., and prof. of crystallography there, in 1915; he was chairman of the Brit. Educational Mission to U.S.A., 1918, and the first president of the Gemmological Association of Great Britain. His writings include a text-book on *Mineralogy* (1902), and articles on the same subject. The mineral intersite, a silver-copper oxide, was named after him in 1898.

Miglierina, tn. of Calabria, Italy, in the prov. of and 7 m. W.N.W. of the tn. of Cantanzaro, on the R. Lamato. Pop. 3700.

Migliorati, Cosimo dei, see INNOCENT (popes), *Innocent VII*.

Mignard, Pierre (1610-95), Fr. portrait painter, brother of Nicolas M., the engraver (1606-68), b. at Troyes, and studied under Vouet at Paris, and later at Rome. He painted portraits of Pope Alexander VII, and many It. princes. In 1657 he was summoned to Paris by Louis XIV., and on the death of Le Brun succeeded to all that artist's positions.

Migne, Jacques Paul (1800-75), Fr. author and theologian, b. at St. Flour, Auvergne. He was ordained in 1824, and soon afterwards pub. *De la Liberté*. It was so criticised that he went to Paris and there started the paper called *L'Univers religieux*. He then opened printing works at Petit-Montrouge. Other works are *Encyclopédie théologique* (171 vols., 1844-1855); *Padrologia latina* (221 vols., 1844-1855), an exhaustive library of the Gk. and Lat. fathers of the Church; and *Scriptura sacra cursus completus* (28 vols., 1840-45).

Mignet, François Auguste Marie (1796-1854), Fr. historian, b. at Aix-en-Provence. In 1822 he went to Paris and pub. his *Histoire de la Révolution française* (1824; trans., 1826; new ed., 1928). He represents the revolution as the natural outcome of the different conditions of time, place, climate, and national temperament. This has led to the charge of fatalism being brought against him, but his work is a remarkably clear account of its subject, giving not only a vivid picture, but at the same time detached and philosophic deductions, the whole being enhanced by

excellence of form and style. In 1830, in conjunction with his friend Thiers, M. founded the Liberal jour. *Le National*. In 1836 he was admitted into the Academy. He pub. *Notices et mémoires historiques* (1843); *Vie de Franklin* (1848); *Histoire de Marie Stuart* (1851); *Charles Quint* (1854); *Rivalité de François I. et de Charles Quint* (1872-75), and the romantic drama *Antonio Perce et Philippe II.* (1845-1846). See life by E. Petit, 1889.

Mignonette, genus *Keseda*, of annual herbs of the family Resedaceae, indigenous to the S. countries of Europe and the Mediterranean generally. The fragrant *R. odorata* was introduced into Britain from Egypt in the middle of the eighteenth century. It is a favourite garden plant, with large pyramidal white and red heads; there are dwarf and double-flowered varieties. The stem branches from the base, and the plant grows as a rather diffuse clump, bearing alternate lance-shaped leaves, simple or three-lobed.

Mignot, Louise, see DENIS, LOUISE MIGNOT.

Migraine, or Hemiergania, terms employed to denote a group of symptoms of which the most distressing is a severe headache. The disease is paroxysmal in character, and usually commences with a dull aching on one side of the head between the cheekbone and the temple. The pain grows gradually more intense, and the patient develops hyperesthesia, or excessive sensitivity. There is also a painful degree of nausea, often leading to vomiting, and the patient may complain of various pains, seated in widely separated parts of the body. In many cases there are indications of hysteria, and little reliance can be placed upon the statements of the patient, who may suddenly recover and appear in quite good health after having been apparently in a state of extreme exhaustion a few minutes before. Visual disturbances and illusions are characteristic. Little is known of the cause of M. It may be simply a form of neuralgia in which the optic nerve is involved. It is attributed by some to eye-strain, though many cases show no hist. of anything approaching excessive use of the eyes. Sir W. Gowers looked upon it as a form of epilepsy. It is common in, though by no means confined to, individuals of a highly strung and badly balanced nervous constitution, or to people of great mental capacity (e.g. Wheatstone the physicist and Herschel the astronomer). The attacks can be relieved to a certain extent by various drugs, such as bromides, chloral, and morphia.

Migration of Animals, periodical movement from one district to another, mainly regulated by the food supply, though it is concerned also with breeding. It occurs in a large variety of animals, but most consistently among birds; in fact, it is believed that nearly every bird migrates in some part of its range. Much valuable information has been collected in recent years by the work of bird marking and observation stations; mention should be made particularly of Herr Gatke's pioneer work on Heligoland, and the more recent

investigations on wildfowl by Peter Scott, as well as the schemes originated by the Brit. Museum (Natural Hist.). Large numbers of birds are caught and liberated after metal rings have been fixed on their legs, the return of which with particulars and date of capture is invited. Fish, such as salmon, can be marked similarly, using metal tags attached to the gill cover. Apart from the enormous distances which many birds have been proved to travel, one of the most remarkable facts elucidated is that birds of a species (e.g. skylark) sometimes cross in their line of migration, some settling in districts which others have just left. The regularity of migratory movements is remarkable in such birds as the puffin or the swift, but spasmodic or irregular migrations have occurred on various occasions, as notably in 1863 and 1888, when Pallas's sand grouse, a native of the plains of Tartary, invaded Britain in great numbers. Similarly, the crossbill and the waxwing make occasional incursions. More than one species of Lepidoptera (butterflies) annually migrates over the North Sea. Crabs and lobsters and some molluscs are known to move considerable distances to fresh feeding-grounds. A number of fish (e.g. the salmon) are anadromous in habit; that is, they live in the sea, but enter fresh water to spawn and afterwards again descend to the sea; while, on the other hand, the eel spawns in the deep sea off Bermuda, and does not return, the young entering the rivers of Great Britain a elvers. In the search for safe breeding-grounds, most of the aquatic mammals migrate long distances from their usual haunts. Many other mammals make fairly regular migrations, their movements being regulated primarily by the changes of the seasons. The routes followed by birds and other migrating animals have remained unchanged since prehistoric times; indeed the lemming is said to swim out to sea from the Scandinavian coast in a fruitless quest for certain islands, which have now disappeared. The method whereby birds find their way on their long migratory flights is unknown, though it has been suggested that they may be guided by their keen sense of time, whereby they are able to judge accurately the length of the day (which varies with the geographical latitude). It must be remembered that the young individuals of such species as the cuckoo follow their parents after a lapse of several weeks. The considerable distance travelled by the Arctic tern is referred to in the article on TURNS. The New Zealand mutton bird, one of the shearwaters, migrates to that country from Siberia, near the Arctic Circle, and the godwit or kuaka of the same country comes down from still further N., i Alaska. On the last part of their journey to New Zealand, both these birds fly across the open ocean from New Caledonia Is., whereas most birds keep close to the coast lines. The departure of the kuaka from Spirits' Bay at the extreme N. of New Zealand is one of the wonders of bird life, and is described as follows by Mona K. Gordon in *Children of Tane* (1938):

'Here at the end of March and on into April the kuaka gather by companies, pouring into the bay from all parts of the country in contingents fifty to a thousand strong. They alight on the beach until there is hardly standing-room for all; every hour of the day brings more and more armies to swell the vast assemblage. Towards evening they show signs of restlessness and agitation until the sky is stained with the rose and gold of sunset. Then, as with one accord, the godwits, crowded almost inextricably on the sands, mount into the air and take a course due north in trailing, wedge-shaped formation.' See A. Meek, *The Migration of Fishes*, 1916; C. B. Williams, *The Migration of Butterflies*, 1930; A. L. Thomson, *Bird Migration*, 1936; and J. Fisher, *Bird Watching*, 1941.

Migration of People, see EMIGRATION; EMIGRATION SOCIETIES; EMPIRE SETTLEMENT ACT; OVERSEA SETTLEMENT COMMITTEE; IMMIGRATION.

Miguel, Maria Evarist, Dom (1802-66), third son of King John VI. of Portugal. In 1822 his mother, Carlota Joaquina, plotted to overthrow her husband and establish M., her favourite son, upon the throne. The attempt failed, and M. consequently spent some years in exile. In 1826, however, John VI. d., and his eldest son, Pedro of Brazil, renounced his right to the succession in favour of his daughter Maria da Glória, it being arranged that she should marry M. Although he had sworn allegiance to the new queen and to the constitution, and in 1827 had been appointed regent, M. ignored his oath, procured his recognition as sole king, and opposed all forms of liberalism in his dominions. In 1834, faced with growing hostility by England, France, and Spain, he renounced his pretence to the throne and retired to Rome, where he d. See PORTUGAL, History.

Mihailovich, Draža (1893-1946), Yugoslav soldier, b. at Shumaliza, served with the Serb. Army in the Balkan wars, 1912-1913, and in the First World War. In the Second World War, when Yugoslavia was overrun by the Germans in 1941, he took refuge, with his troops, in the forests and hills, being recognised by the exiled Yugoslav Gov. of King Peter as commander-in-chief and war minister. He was also recognised by the Brit. military authorities in the middle E., who attached liaison officers to his forces. This was the origin of the Chetnik movement. Meanwhile, however, a Communist resistance movement was developed under Marshal Tito. M. vainly tried to combine the two resistance movements, but, eventually, his monarchist views led him to collaborate with the Germans and, against the Communist partisan forces. This led to savage attacks by the Germans against the civil pop., and M. then relaxed his efforts so as to avoid such sacrifices, though the partisans of Tito let nothing deter their resistance to the Axis forces. After the Communist partisans had accused, probably with justification, the Chetniks of collaboration, allied support was trans-

ferred to Tito. M. was also repudiated by the Yugoslav exiled gov. M. fell into Tito's hands in March 1946, and three months later he was tried, convicted of treason, and shot in Belgrade. See also YUGOSLAVIA, History. See B. Lazitch, *La Tragédie du général Draža Mihailović*, 1916.

Mihrab, Mohammedan architecture, the niche which, in a mosque, indicates the direction of Mecca.

Mikado, former title of the emperors of Japan, for which the Chinese Tenshi (Son of Heaven), or Tenno, has recently been substituted in general use. The present M. succeeded his father, Taisho, in 1926, and is the 126th of the imperial line, the first M., Jimonu-Tenno, having begun to reign in 660 B.C. In 1945 the Emperor Hirohito repudiated his divinity; the constitution of 1946 eliminated the phrase 'sacred and inviolable,' and made the emperor a constitutional monarch.

Mikania, large genus of evergreen climbing plants (family Composite), natives of tropical America. *M. scandens* will grow on a trellis in the open in summer.

Mikkeli (dept. of Finland). See ST. MICHEL.

Mikkelsen, Ejnar (b. 1880), Dan. polar explorer. In 1907 he was instrumental in helping to disprove the polar land theory, as in 72° N. lat. and 150° W. long. a sounding 339 fathoms failed to reach the bottom. In 1909 M. and Iversen set out in the *Alabama* in search of Myles Erichsen's records, the main body of the expedition returning without them. Their safety was despaired of, but, having accomplished their object, they reached Europe in 1912, after spending the previous winter on Bass Rock, near Shannon Is. He commanded the colonising expedition to Scoresby Sound in 1924 and S.E. Greenland in 1932. He has written *Conquering the Arctic Ice* (1909); *Lost in the Arctic* (1913); the novel *John Dale* (1921); and *Norden for Lov og Ret* (trans., as *Frozen Justice, a Story of Alaska*, 1922). Other works include *Med 'Grönland' til Scoresby-sund* (1925) and a hist. of the E. Greenland Eskimos (1934). M. was awarded the Patron's medal in gold by the Royal Geographical Society in 1934.

Miklas, Wilhelm (b. 1872), Austrian statesman, b. at Krems. He entered the Austrian Parliament in 1907, and became president of the republic in 1928. He retired in 1938, on the *Anschluss* of Austria to National Socialist Germany.

Miklosich, Franz von (1813-91), Slavic philologist, b. at Luttenberg, Styria. From 1850 to 1886 he was prof. of Slavic philology in the univ. there. His chief works are *Lexicon Palaeoslovenico-Graeco-Latinum* (2nd ed., 1865); *Etymologisches Wörterbuch der slavischen Sprachen* (1886); *Vergleichende Grammatik der slavischen Sprachen* (1871-79); and *Allslavische Lautlehre* (3rd ed., 1878). See M. Murko, *Miklosichs Jugend und Lehrfahre*, 1898.

Mikolajczyk, Stanislaw, Polish statesman, see EASTERN FRONT or RUSSO-GERMAN CAMPAIGN IN THE SECOND WORLD WAR; POLAND, History.

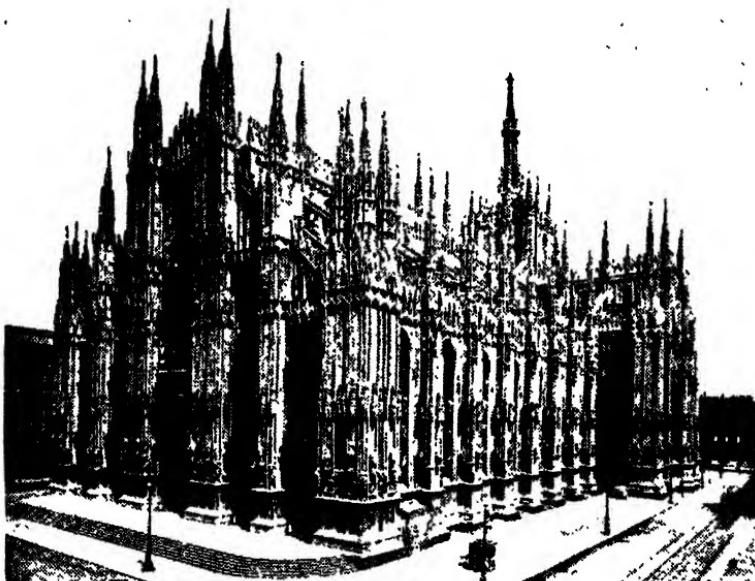
Miknas (in Morocco), see MEKINEZ.

Mikulov, see NIKOLSBURG.

Milagro, tn. of Ecuador on the Guayaquil-Quito railway. It is an important shipping centre for a rich agric. dist. Pineapples are much grown here. Pop. 10,000.

Milan I. (1854-1901), prince of Serbia from 1868 to 1882, and king of Serbia from 1882 to 1889, was b. at Jassy in Rumania. On the assassination of his cousin, Prince Michael Obrenovich (1868) M. was proclaimed prince, and ruled under a regent till he came of age in 1872. In

which is almost circular, is encompassed on three sides by walls and low ramparts; it has a circuit of about 7½ m., and is entered by ten gates. Notwithstanding its great antiquity, M. possesses but few remains of its early splendid structures. Modern M. is one of the most opulent and populous cities of Italy; its best streets are regular, wide, and well paved, and kept with scrupulous care. M. abounds in churches worthy of note: of these, the principal is the famous Gothic cathedral, the Duomo, which, with the exception of



W. F. Mansell

MILAN CATHEDRAL

1876 he allied himself with Russia, and declared war against Turkey, winning the independence of Serbia, and the kingship for himself, in 1882. In 1889 he abdicated in favour of his son, Alexander, and retired to Paris. In 1894 he served as commander-in-chief of the Serbian army for a short time, but was banished as a result of a quarrel over Alexander's marriage.

Milan (It. *Milano*): 1. Prov. of N. Italy in Lombardy, 1078 sq. m. in area, bounded by the Rs. Po, Ticino, and Adda, which are connected by numerous canals. It includes most of the fertile plain of Lombardy, and its chief products are corn, rice, cheese, butter, cattle, silk, fruit, and wine. The prov. is an important industrial area, with manufs. of textiles, rubber, iron, machinery, tools, chemicals, etc. Pop. (1928) 1,891,000. 2. Chief city of Lombardy, cap. of M. prov. stands on the R. Olona, in the centre of the great plain of Lombardy. The city,

St. Peter's in Rome, is the most magnificent eccles. structure of Italy. Within it Napoleon was crowned King of Italy in 1805. Here also instead of the Lat. or Rom. liturgy, the Ambrosian liturgy is celebrated, an interesting relic of an otherwise obsolete rite. The Duomo lost all its window glass in 1943, together with some exterior figures and pinnacles, but the stained glass had been previously removed to safety. There is also the church of St. Ambrose (founded by that saint in the fourth century), the most antq. in M., containing inscriptions, sarcophagi, and monuments full of antiquarian interest. This, the most important church in the city (actually a twelfth-century building, incorporating parts of the older church of A.D. 800), suffered severely in the Second World War; the cloister by Bramante was practically destroyed, part of the nave fell, the N. wall was breached, many windows have gone, sev. chapels were

damaged, and the ceiling in the sacristy by Tiepolo was ruined. Another famous church is the Dominican church of Santa Maria delle Grazie, which contains in its refectory the famous 'Cenacolo,' or 'Last Supper,' by Leonardo da Vinci. This famous fifteenth-century abbey church was severely damaged during the recent war; the outer walls of the side chapels and vaults were demolished or displaced by blast, and the cloister was almost entirely destroyed. The wall of the refectory facing Leonardo's 'Last Supper' collapsed, bringing down the roof, and the painting by Montorfano on the opposite wall was injured. Leonardo's 'Last Supper,' which was painted on one of the end walls (1494-97) as a fresco, was, at the time of the air raids, heavily protected with sand bags and steel scaffolding; and according to official reports the painting, which has been much restored, is in satisfactory condition. Among the secular buildings of M., as they stood before the war, the most noteworthy was the magnificent Brera Palace, used as a museum and library; it has also attached to it an observatory and a botanical garden. The Brera Gallery received a direct hit on the façade giving on to the Via Brera, and the roofs were largely burned. The State Univ., founded in 1924, accommodates about 1300 students; and there are also higher schools for agriculture, commercial education, and a veterinary college. The charitable institutions are numerous and splendidly endowed. Before the Second World War the Ospedale Maggiore, or Great Hospital, founded by the ducal house of Sforza in 1456, accommodated as many as 2000 patients. It was a vast and very fine brick structure, begun in 1457 by Antonio Filarete, but was grievously shattered in the raids, one-half of it being razed with immense interior destruction, though, at least, the central and other parts of the façade remain. The Milanese places of amusement were on a grand a scale as the other public buildings of the city, the first in point of celebrity being the theatre of La Scala (q.v.), which could accommodate 3600 spectators. This famous theatre, gutted in the air raids, was reopened in 1948.

As has been noted M. suffered widespread damage in the raids of the Second World War. Only in few cases, however, did this amount to complete destruction, but the damage to interiors was widespread and irremediable. The most severe attacks were delivered Aug. 13-16, 1943, the city burning after the raids for a week owing to the scarcity of water. Subsequent air raids inflicted less damage and in many instances reconstruction by the It. authorities had been begun before the arrival of the Allies. Of the twenty-seven churches on the official list of protected monuments only five escaped damage. Those damaged included S. Lorenzo, the most anc. church in M., which was built about 560 on the ruins of a Rom. building, altered after a fire in 1071 and again restored about 1573; its interior was not damaged, but the outside wall at the E. end sustained damage, as also the cover-

ing of the dome. Again, S. Pietro in Gessate, a fifteenth-century church in the Lombard style, was half ruined, but the façade walls and part of the roof remain. The Teatro dei Filodrammatici was burnt out. The interior of the Archinti palace in the via Olmetto was destroyed, together with frescoes by the two Tiepolos. Severe damage was done to the Palazzo Litta; the Palazzo Marino (gutted); the Palazzo Ponti (only the courtyard and façade facing the garden escaped damage); Palazzo Reale (more or less burnt out); Palazzo Senato (gutted). Severe damage was also done to the Castello Sforzesco (but the art treasures stored in its basement were uninjured); the roofs of the Piazzo d'Armi, including the municipal library, and of La Rocchetta (with its museum collections) were almost entirely destroyed. The Borromeo hall and the Federici and hall of the Ambrosian Library were burnt out, but the vaulted ceilings survived. Finally, the Poldi-Pezzoli Museum was almost entirely destroyed, though the collections had been previously removed to safety; and the Scala Museum was seriously damaged. M. was occupied by the Allied Fifth Army on April 29, 1945. (See also ITALIAN FRONT IN SECOND WORLD WAR.) M. carries on an immense inland trade in grain, rice, wine, and cheese, and has considerable manufs. of silk goods, ribbons, cutlery, motor-cars, aircraft, locomotives, machinery, electric cables, furniture, porcelain, etc. The archiepiscopal see of M. is usually occupied by a cardinal of great prestige in both Church and State. Pop. 1,267,600. See Dorothy Muir, *A History of Milan under the Visconti*, 1924; and H.M.S.O., *Works of Art in Italy: Losses and Survivals*, vols. I and II, 1945.

Milan, Bishopric and Duchy of. The position of M. in the Middle Ages may be traced to the influence of her bishops. St. Ambrose, who occupied the see from 374 until 397 successfully defied the authority of the emperor Theodosius I. After the estab. of the Lombard kingdom in 569 the bishops of M. became the rallying point of opposition both to Arianism and to foreign rule; and their temporal authority was further increased by Charlemagne's defeat of the Lombards in 774. In the confusion which followed their emperor's death the archishops became the only real centre of authority in M. During the next two hundred years the tyranny of the nobles drove the common people to seek the protection and authority of the Church, under whom the city increased in numbers and independence, and learned the art of self-government. It was archbishop Hieribert (1018-45) who invited into Italy and crowned Conrad, king of Germany, with the iron crown of Lombardy. In the thirteenth century Archbishop Otto Visconti, as leader of the nobles, defeated the Torriani at Desio (1277), and from that time until 1447 the Visconti ruled the city. Following the death of Filippo Visconti in that year a republic was proclaimed. It lasted for only three years. In 1450 Francesco Sforza (1401-66) (see SFORZA) became duke of M. by right of conquest.

He had married Bianca, Filippo's heiress. The dukedom continued in the line of Francesco's eldest son Galeazzo until 1494, when it was seized by Galeazzo's brother Lodoviro, il Moro (1451–1508), the patron of Leonardo da Vinci. On the death of his son Francesco in 1535 M. became a dependency of Spain under Charles V. See D. Muir, *A History of Milan under the Visconti*, 1924; and A. Colombo, *Milano preromana, romana e barbarica*, 1928.

Milan Decree, promulgated by Napoleon on Dec. 27, 1807. It purported to declare the whole Brit. empire to be in a state of blockade, and forbade all countries to trade with Great Britain or to use any article of Brit. manuf.

Milan, Edict of, proclaimed by Constantine, after the conquest of Italy in the early years of the fourth century A.D., its object being to secure to Christians the restoration of their civil and religious liberties.

Milanion, see ATALANTA.

Milasa, or Milas, tn. in Asiatic Turkey 84 m. S.S.E. of Smyrna (İzmir), a centre of carpet manuf. Pop. 13,000.

Mila y Fontanals, Manuel (1818–84), Sp. scholar and author. He studied first at Barcelona and then at Cervera, obtaining a professorship of literature at the univ. of Barcelona when twenty-seven years old. Amongst his publs. may be mentioned his treatise *De los trovadores en España* (1866), and *De la poesía heróico-popular castellana* (1873). See study, with bibliography, by J. Roig y Roqué, 1912.

Milazzo (ancet. *Mylas*), seaport tn. in the prov. of Messina on the N. coast of Sicily. The older portion of the tn. rests upon a hill, whilst the more modern portion occupies an isthmus. There is a good harbour, and the prin. exports are tunny fish, fruit, silk, olive oil, and wine. The old cathedral, which was abandoned before the Second World War, was plundered by civilians after the bombardment of 1943. The church of the Carmine sustained some damage, but that of the Porto Salvo was damaged beyond repair, as were the Paluzzi Convento, Proto, and Ryolo and the Casa Lucifero. Garibaldi defeated the Neapolitans here in 1861. The gulf of M. extends for 16 m. and has been the scene of many naval engagements, including the first Rom. naval success over the Carthaginians in 260 B.C.

Milch, Erhard (b. 1892), Ger. Air Force commander. In the First World War he was an army pilot, and afterwards became a civilian aviator. In the Nazi administration, in 1933, he was appointed secretary of state in the Air Ministry. Lieutenant-general, 1935; general, 1936; colonel-general, 1938. In the Second World War his chief service was in N. Africa and, in Dec. 1942, he had risen to air field-marshal in Tunisia. After the war he was tried at Nuremberg as a war criminal, convicted, and sentenced to imprisonment for life.

Mildenhall, m.rkt. tn. of Suffolk, England, 12 m. from Bury St. Edmunds and 76 m. from London, and situated on the

R. Lark. In and before the Second World War it was an important R.A.F. aerodrome. In 1934 it was the starting point of the Britain to Australia airrace. It has a typical E. Anglian market cross and manor house. Near M., at W. Row, in 1942–43, was found a hoard of Rom. silver table-ware, now in the Brit. Museum and known to archaeologists as the M. treasure and said to be the finest of its kind to come into the keeping of the nation as treasure trove. It consists of bowls, dishes, spoons, platters, and goblets, ornamented with foreign hunting scenes, embossed figures of fine quality and classical design, and niello work. Similar hoards, but not in such perfect condition, were found near Coleraine, Londonderry, in 1854 and, in 1919, during excavations on Traprain Law, East Lothian. It is assumed that these and other hoards were buried by their owners to save them from falling into the hands of marauding Picts and Scots. See J. W. Brailsford, *The Mildenhall Treasure* (Brit. Museum), 1947.

Mildew, name for a variety of microscopic parasitic fungi. Rose M., strawberry M., and hop M., are allied species. Treatment with sulphur in powder or in solution as a salt checks the spread of most Ms.

Mildmay, Sir Walter (1529–89), b. at Chelmsford. He became M.P. at the age of thirty-three, and was chancellor of the exchequer thirteen years later. He was the founder of Emmanuel College, Cambridge.

Mildura, city of Victoria, Australia, in a fruit-growing dist. under irrigation, 351 m. from Melbourne. A handsome bridge spans the R. Murray, which was constructed by the govs. of Victoria and New S. Wales at a cost of £150,000. It is a thriving city with five churches, two state schools, branches of seven banks, savings banks, Carnegie library, hospital, and court-house. Its industries are cordial factories, olive oil factory, saw and planing mills. Has a chamber of commerce and a fruit-growers' co-operative company. Pop. 9530. The area of the surrounding dist. M. Shore, is 4171 sq. m. and the pop. 16,000.

Mile (from Lat. *mille*, a thousand), was originally a Rom. lineal measure of 1000 paces (see PACE). It has long been used as a measure of length in Eng.-speaking countries, but with varying meanings. Similarly, on the Continent of Europe the length of the M. varied with each country, often with each dist., being usually some modification of the Rom. M. The length of the legal M. in the Brit. empire and the U.S.A. is now 1760 yds. For a nautical M. see KNOT; LOG.

Mile End, dist. of E. London. Once a hamlet of Stepney par., it now forms the central and N.E. parts of the bor. of Stepney.

Miles, Nelson Appleton (1839–1925), Amer. soldier, b. at Westminster, Massachusetts. He entered the army in 1861 and served with the Federals in the Civil war. He became brigadier-general of volunteers in 1864, three years later

holding the same position in the regular army. In 1895 he became commanding general of the U.S.A., in succession to Gen. J. Mca. Schofield, and was conspicuous in successfully dealing with the Indian outbreaks of the Cheyennes and Comanches, the Sioux in Montana, the Nez Perces, and the Apaches. In 1898 he directed the military operations of the war with Spain. He retired from active service in 1903. He pub. *Personal Recollections* (1896); *Military Europe* (1898); *Observations Abroad* (1899); and *Serving the Republic* (1911).

Miletto, tn. in the prov. of Catanzaro, Italy. 40 m. N.N.E. of Reggio, destroyed by an earthquake in 1908, when 2300 lives were lost.

Miletus: 1. Son of Apollo and Aria of Crete, fled from Minos to Asia, where he built the city of M. Ovid calls him a son of Apollo and Defone, and hence Deionides. 2. One of the greatest cities of Asia Minor, belonged territorially to Caria and politically to Ionia, being the southernmost of the twelve cities of the Ionian confederacy. Its ter. was rich in flocks, and the city was celebrated for its woollen fabrics, the *Milesia vellera*. At a very early period it became a great maritime state, and founded numerous colonies. It was the b.p. of the philosophers Thales, Anaximander, and Anaximenes, and of the historians Cadmus and Hecatæus. It was the centre of the great Ionian revolt against the Persians, after the suppression of which it was destroyed (494 B.C.), but recovered sufficient importance to oppose a vain resistance to Alexander the Great, which brought upon it second ruin. Under the Rom. empire it still appears as a place of some consequence. Its site is occupied by Palatia.

Milfoil, or Yarrow (*Achillea Millefolium*), plant with thrice-pinnatifid leaves and white, pink, or purple flowers (family Composite). It is common on pastures.

Milford, Sir Humphrey (Sumner) (b. 1877), Brit. publisher. Educated at Winchester and New College, Oxford, he later served as assistant to the secretary to the delegates of the Clarendon Press in Oxford and in London. In 1913 he was appointed publisher to the univ. of Oxford, a position which he held until 1945. From 1919 to 1921 M. was president of the Publishers' Association of Great Britain and N. Ireland. He was knighted in 1936. Besides editing the *Oxford Book of Regency Verse*, M. has ed. the poems of Cowper (1904); (Clough) (1910); and Leigh Hunt (1923).

Milford: 1. Parl. bor. and seaport of Pembrokeshire, S. Wales, on the Haven, 9 m. S.S.W. of Haverfordwest. It has passenger and cattle traffic with Irish ports, and is engaged in engineering, shipbuilding, and fishing. M. was originally founded in 1790 to serve as a naval station, but this was afterwards moved to Pembroke. Pop. 10,000. 2. Tn. in Worcester co., Massachusetts, U.S.A., 1c. m. S.E. of Worcester, on the R. Charles. There are important granite quarries, and manufs. of boots and shoes, electric

motors, and metal, and synthetic rubber products. Pop. 15,300. 3. Tn. in Delaware, U.S.A. Pop. 4000.

Milford Haven, Marquess of (Prince Louis Alexander Battenberg, later Mountbatten, earl of Medina and Viscount Alderney) (1854–1921), b. at Gratz, son of Prince Alexander of Illeso, who morganatically married Countess Julie Thérèse von Hanke, later given the rank of princess. Early naturalised in England, he entered the Brit. Navy at fourteen years of age, becoming midshipman in 1869. In the Egyptian war he received the Egyptian medal and Khedive's Bronze Star for distinguished services. In 1884 he married his cousin, Victoria, eldest daughter of Princess Alice, and grandchild of Queen Victoria. A man of many parts, but above all a widely experienced authority on naval affairs, he served on many naval committees before his appointment as director of naval intelligence at the Admiralty, 1902. Rear-admiral 1904, he became First Sea Lord, 1912. The perfect state of the navy on the outbreak of the First World War in its readiness for immediate mobilisation was largely due to his forethought and general ability. But, by reason of his Ger. origin, totally unfounded suspicion fell on him, and in Oct. 1914 he voluntarily resigned in favour of Lord Fisher. By royal request he gave up his foreign titles in 1917, assuming the surname Mountbatten, and entering the peerage as M. of M. H. He retired from the navy in 1918. Died suddenly, and was buried with naval honours at Whippingham. Pubs.: *Men-of-War Names* (1897, 1908); *British Naval Medals* (1919); and *Naval Medals (Foreign)* (1921).

Milford Haven, natural harbour of Pembrokeshire, S. Wales, running inland for 17 m. and varying in breadth from 1 to 2 m. It is the finest harbour in Britain, with a depth of from 15 to 19 fathoms. During the Second World War it was a flying-boat base.

Milford Sound, fiord on the S.W. coast of South Is., New Zealand, extending for 10 m. and about 1 m. in breadth. It has numerous waterfalls. The only means of access to Milford Sound is by Milford Track, passing by Clinton R., which runs into Lake Te Anau.

Milhaud, Darius (b. 1892), Fr. composer, b. at Aix-en-Provence. He studied at the Paris conservatoire under Gédalge, Widor, and d'Indy. Whilst attached to the Fr. legation at Rio de Janeiro in 1917–19 he met Paul Claudel, who frequently collaborated with him as librettist. About 1920 he became a member of 'Les Six,' and two years later was represented for the first time at the festival of the International Society for Contemporary Music. In 1940 he emigrated to the U.S.A. Both as satirist and tragedian he has shown high quality; he has parodied musical comedy conventions in *Le Train bleu* (1924), and caused sensations with such flights of fancy as a setting of a florist's catalogue for chamber orchestra and voice (1921), and *Machines agricoles* for the same combination. His varied works include operas, ballets, incidental

music to Gk. plays, symphonic suites, books of songs, etc.

Miliaria Populosa, see PRICKLY HEAT.

Military Academies, see under MILITARY EDUCATION.

Military Aircraft, see AEROPLANE; BOMBER; FIGHTER.

Military Cross, instituted by royal warrant, Dec. 28, 1914, for award to Brit. officers of the substantive rank of captain or of lower commissioned rank, and to warrant officers (Indian and colonial forces included), in recognition of distinguished and meritorious services in time of war. It consists of a silver cross, having on each arm the imperial crown, and bearing in the centre the royal and imperial cipher.

attention in the course of active hostilities while other operations are conducted elsewhere. Such a demonstration during an actual attack is called a feint.

Military Education and Military Schools.

(a) **General**.—Educational training is closely co-ordinated with other forms of training in order to develop the intelligence, initiative, and sense of responsibility; to inculcate loyalty, morale, and *esprit de corps*, and to return the soldier to civil life a more efficient citizen with enhanced prospects of earning his living. The necessity for decentralising responsibility imposed by modern war makes it essential for quite junior ranks to exercise initiative, and individuals who can act



High Commissioner for New Zealand

CLINTON RIVER, FROM MILFORD TRACK: THE ROAD TO MILFORD SOUND

The mountain rising on the left is Mount Mackenzie.

The cross confers no individual precedence, but entitles the recipient to the addition after his name of the letters 'M.C.' Between Aug. 1914 and Jan. 31, 1920, 36,824 awards of the M.C. were made to personnel of the Brit. forces for services in the field. In addition to these, 2939 first, 167 second, and 4 third M.C. bars were conferred. During the Second World War a grand total of 10,892 M.C.s were awarded. Of this number 10,784 were awarded to the army, being 10,280 crosses, plus 480 first bars, plus 24 second bars; 38 to the navy and royal marines, being 37 crosses plus 1 first bar; and 70 to the R.A.F., being 69 crosses, plus 1 first bar. The M.C. is an army decoration, and the awards to members of the other services are for good work done while attached to the army.

Military Demonstrations, in M. tactics an operation intended to deceive the enemy by pretending that danger is threatening him from another quarter, thus distracting his attention from the real, more imminent peril, and inducing him to divide his forces. A means of engaging the foe's

rightly without supervision are required to a much greater extent than formerly. It is therefore made the duty of all officers to promote educational training among other ranks.

(b) **Men**.—The purely educational training of a soldier is divided into two parts: (i.) the compulsory period, up to and including the attainment of his second class certificate of education (there are special estabs. for the elementary schooling of recruits found to be virtually illiterate), and (ii.) the voluntary period, i.e. work for the first class and special certificates. In units the training is carried on under the educational officer, supervised by the Command Army Educational Corps officer at headquarters. The actual instruction is given by unit instructors for third and second class certificates and by personnel of Army Educational Corps for higher certificates. Every recruit on enlistment is educationally 'tested,' and his standard noted. This is not work for a certificate, but a part of the routine of enlistment. The syllabus for certificates includes the following subjects: arithmetic,

regimental hist., English, practical mathematics, army and empire, communications of empire, map-reading, languages, and geography. The following are, in addition, included for the special certificate: economics, mechanics, chem., physics, biology, and physiology. The army special certificate is accepted by many univs. and colleges as the equivalent of matriculation or entrance examination.

M. training commences on enlistment at depots. After a few months' training in the rudiments, the men are sent to join their service units, where training is completed. Ann. training is carried out to ensure that men are maintained at a required standard. During the winter months 'individual' training is carried out in such subjects as map-reading, use



*Imperial War Museum: Crown copyright
BATTLE SCHOOL'*

of compass, field sketching, and indoor schemes. 'Collective' training is carried out during the remainder of the year, and is mainly for the benefit of leaders, from platoon commanders upwards, culminating in army manoeuvres. Musketry training is usually carried out in the summer. Courses are undergone at the various colleges, schools, and training estabs., the principal being: Royal Artillery Medical College for laboratory assistants; School of Artillery, for battery surveyors, junior commanders, drill and gunnery; Army School of Chemical Warfare, for potential instructors in gas warfare; School of Education, for the training of regimental personnel in educational work; School of Hygiene, for various subjects, including training of regimental sanitary squads; School of M. Engineering, for training in engineering science; Royal M. School of Music, for training of students for bandmasterships and pupils (boys) for bandsmen; Physical Training School, to provide instructors for units and staff; R.A.O.C. Training Estab. for special training in duties; School of

Signals, instructors' courses; small arms schools, special training in musketry; vocational training centres, for teaching soldiers shortly to be discharged a trade, with a view to enhancing their prospects of obtaining employment in civil life on discharge.

(c) *Officers.*—The normal method of entry into the commissioned ranks is through the Royal M. Academy, Sandhurst (after at least six months' service in the ranks). Previously infantry and cavalry candidates were trained at the Royal M. College, Sandhurst, and artillery and engineer candidates at the Royal M. Academy, Woolwich; but in 1946 these two institutions were amalgamated as the Royal M. Academy, Sandhurst (see SANDHURST). While a course at the academy is the normal avenue to a regular commission, a proportion of commissions are offered to candidates by direct entry from the univs. and from the auxiliary forces. Courses are of eighteen months' duration. Young officers of the Royal Artillery and Royal Engineers on leaving Sandhurst undergo post-graduate courses of technical training for their respective arms, either at the School of Artillery, Cambridge Univ., or School of M. Engineering. These courses are considered necessary in view of the extended range of engineer science and the developments in modern artillery. By the time the cadets join their regiments they are well grounded in M. science, and prepared for the practical training they afterwards receive. Their first few years in the service units are of continued study with the view of passing the necessary examinations for promotion. In the case of majors, courses are arranged at the Senior Officers School in higher tactical training and theoretical and practical instruction in the actual command of troops of all arms. Officers of the Territorial Army are eligible for these courses, which are of three months' duration. Specialised training is also given at the schools and colleges mentioned above for men. Officers are encouraged to write articles and essays on professional subjects for service journals and others of good standing. Some journals grant medals for prize essays.

Military Graves, see GRAVES, SOLDIERS'.

Military Intelligence, see INTELLIGENCE, MILITARY, AND SECURITY.

Military Knights of Windsor, body of retired officers attached to the order of the Garter. They were formerly known as Poor Knights, ranking below the ordinary knights. The order originated in 1349, when it consisted of twenty-six veterans of Edward III.'s reign. They are appointed by the king from officers who have rendered meritorious service, but are not in a position suitably to maintain themselves, and they are granted a small stipend together with quarters in Windsor Castle, whence their designation. Until 1906 the order was part of an eccles. college under the dean of Windsor, but was then transferred to the governor of Windsor Castle. Their stipend comes from the college revenues, and every knight of the Garter on appointment to that order contributes

a sum for apportionment among them. Their uniform is that of the early nineteenth century, and was assigned to them by William IV., who prefixed the word 'Military' to their title. The number was fixed at thirteen in 1919.

Military Law is laid down in the *Manual of Military Law*, issued by command of the Army Council, as being 'the law which governs the soldier in peace and in war, at home and abroad.' M. L. is contained in the Army Act. (*see also under Army*), the Acts relating to the Reserve and Auxiliary Forces, and certain other Acts applied to the army, such as the Cheap Trains Act, 1883, relating to conveyance of troops; the Regimental Debt Act, 1893, relating to the effects of deceased officers and men; and the Emergency Powers Act, 1920, which makes special provision for the protection of the community in cases of emergency, supplemented by the King's Regulations for the Army and the Army Reserve, by other regulations, *e.g.* those for the Militia (Supplementary Reserve) and Territorial Army, by Royal Warrant, *e.g.* those relating to pay, promotion, etc., and by Army Orders and Army Council instructions. The Army Act is an Act of Parliament dealing with discipline, courts-martial, enlistment, and allied subjects, and has in itself no part in the operation, for it continues in force so long only as Parliament from time to time decides. It is annually brought into operation by the Army and Air Force Act, which must become law by April 30, and it is by this system of ann. Acts that Parliament retains control over the land forces of the Crown. The Army Act is part of the statute law of England, and though that part of it which relates to discipline is administered by army tribunals and not by the civil courts, it is construed in the same manner, and carried into effect under the same conditions as to evidence (*q.v.*) and otherwise, as the ordinary criminal law of the country. Though the object of this special code of law is twofold, namely to provide for the maintenance of discipline and for administrative matters, in practice the term is more often used with reference to the disciplinary provisions alone. There is not in England, as in many foreign countries, a special law defining the relations between the military and civil power in cases of riot and insurrection or the intermediate state known as an *état de siège*. Troops when called out to assist the civil power in these cases in Great Britain are under M. L. as soldiers, but they are also as citizens subject to the ordinary civil law to the same extent as if they were not soldiers. Their M. character is superimposed on their civil character, and does not obliterate it (*see A. V. Dicey, Introduction to the Study of the Law of the Constitution*, 1885). M. L. must not be confused with martial law, which latter means the suspension of the ordinary law and the gov. of a country or parts of it by M. tribunals of its own army. *See also* ARMY, under various sub-heads; ENLISTMENT; COURTS-MARTIAL (showing the changes made since the First World War); IMPRESSION; OFFICIAL SECRETS.

In the U.S.A. the first articles of war were drawn up in 1775; in 1806 the present code was estab., which is practically the same as the Eng. code. In 1864 the first M. L. estab. was made with the name of Bureau of M. Justice. In 1883 this bureau was consolidated with the judge-advocates' dept. There is a judge-advocate for each M. div., who is responsible for the whole machinery of court-inartial.

Military Medal, instituted by royal warrant in March 1916 for award to non-commissioned officers and men of the Brit. forces for bravery in the field. Women (whether subjects or foreign persons) were made eligible by a later warrant, but only on the special recommendation of a commander-in-chief, for bravery and devotion under fire. The M.M. is a silver medal, bearing the royal effigy on the obverse and, on the reverse, the words 'For Bravery in the Field,' encircled by a wreath surmounted by the royal cipher and a crown. Some 11,000 M.M.s. were awarded in the Second World War.

Military Nursing Service (Queen Alexandra's Imperial Military Nursing Service). Nursing in the army was originally performed by soldiers' wives, and it was not until Florence Nightingale went to the Crimea in 1854 with forty nurses that a proper service was inaugurated. From that beginning sprang the army nursing service, and at that time also began the slow advance towards official recognition, legal professional status not being conferred until the passing of the Nurses' Registration Act in 1919. Provision was made for the appointment of nurses to all M. general hospitals in 1866, but it was not until 1881 that an army nursing service was formed. The Egyptian campaign of 1882 accelerated the organisation of the nursing service for overseas work, and sisters were sent to military hospitals at Gibraltar and Malta. The headquarters of the service were fixed at the Royal Victoria Hospital, Netley. The reserve service came into being in 1897. During the S. African war (1899-1902) the nursing service greatly expanded, and the experiences of that campaign led, in 1902, to the appointment of a committee, under the presidency of Mr. St. John Brodrick (later Earl Midleton) to inquire into the situation. The outcome was the estab. in 1902 of the Q.A.I.M.N.S., Queen Alexandra being its first president. She was succeeded in her office by Queen Mary. In 1926 the service in India was amalgamated with the Q.A.I.M.N.S. In 1914 the actual service was only 300 strong, but in that same year 2223 trained nurses were enrolled with the reserve, and 1803 were sent abroad. By 1919 the service and its reserve had a membership of 10,104. During the First World War the service did excellent work, and many of its members gained distinction (for a brief official account see War Office, *Nursing in the Army*, 1930). At the outbreak of the Second World War, the total peace estab. of Q.A.I.M.N.S. in the various M. hospitals at home and abroad was 624. On Sept. 10, 1939, the first six army sisters landed

in France; 1300 were evacuated with the R.E.F. at Dunkirk. Army sisters sailed with the army to every war area, and shared its fortunes. In Florence Nightingale's day it was specifically stated that the nurses were for the base hospitals in the war area. In the Second World War however, they shared the hazards of total warfare. In Singapore the sisters worked in a hospital between the Brit. and the Jap.; they learned that the Jap. were at their gate, and fully expected to be taken prisoner. Much the same conditions obtained in Greece. No army sisters fell into the enemy's hands in France or in Greece, but from Singapore some were lost in the evacuation, and many were missing, while in Hong Kong fourteen sisters remained in enemy hands; all were raped, and some were murdered. The sisters might be posted to base hospitals, field hospitals, casualty clearing stations, ambulance trains, hospital ships, or to mobile surgical teams. In the Second World War they were to be found wherever the R.A.M.C. were found, except in the actual battle zone, working in close co-operation, and adding their nursing skill to medical skill, to combine the most effective aid for the wounded (*see Ada Harrison (editor), Grey and Scarlet, 1944*).

The pay of the Q.A.I.M.N.S., as laid down in a 1946 amendment to the Pay Warrant of 1940 is at the following rates:

Rank	Pay		
	Minim- um	Incr- ement	Maxi- mum
Matron-in-chief	755	—	—
Chief principal matron	635	—	—
Principal matron	525	—	—
Matron	300	25	450
Senior sister	250	10	280
Sister:			
On appointment	130	—	—
After 1 year's service	160	10	220
After 5 years' service at £220	—	—	240
After 5 years' service at £240	—	—	260

Military Police, Royal Corps of. Branch of the M. forces which maintains law and order amongst soldiers, controls M. traffic, guards M. installations, and participates in anti-espionage work. It is not, like many European M. P. forces, such as the It. *carabinieri* or Fr. *gendarmerie*, a militarised police force, having authority over the civilian pop. of its own country. A corps of M. foot police was estab. in 1855, and in 1877 a similar body of mounted police, the two being amalgamated in 1926. Three new branches were formed in 1940: C.M.P. (V.P.) ('Blue Caps') for the security of vulnerable points; C.M.P.

(T.C.) ('White Caps'), for traffic control, including the organisation of traffic through minefield gaps; and C.M.P. (S.I.B.) for special investigation work equivalent to that carried out by the civil C.I.D. The 1942 landings in N. Africa saw the first use of beach provost companies. After the Ger. surrender the M. P. were given the task of enforcing the orders of the M. gov. of the occupied ter. Heavy casualties were suffered by the corps, which at the end of the war had a strength of 35,000. The prefix 'Royal' was granted in 1946 in recognition of the corps' wartime service. The branch is commanded by the provost-marshal under the adjutant-general, who is responsible for the discipline of the army. In the Brit. service M. P. wear red tops to their hats, and 'Red Caps' are famous the world over.

Military Prisons. The secretary of state for war has power to set apart any building or part of a building under his control as a M. prison or detention barrack. In 1939 there was only one M. prison in the United Kingdom, a part of the detention barracks at Aldershot being set aside for a prison. Offenders who are sentenced to imprisonment for purely M. offences and are not to be discharged from the army on completion of their sentences normally undergo such sentences in the M. prison, but if they have committed a civil offence and are sentenced to imprisonment they are usually sent to a civil prison; but during the Second World War sections of several prisons were set aside for soldiers serving terms for M. offences. M. P. were improvised in special camps in oversea theatres (called in U.S. Army 'stockades'). Soldiers are sentenced to various periods of detention for purely M. offences, and serve their sentences at a detention barracks. Here they continue their training as soldiers with certain limitations, e.g. they carry out drill, musketry and physical training. M. P. and detention barracks are governed by commandants, who have a staff to assist them.

Military Requisition (land), see LAND FOR MILITARY PURPOSES.

Military Science, see FIRE TACTICS

Military Security, see under INTELLIGENCE, MILITARY, AND SECURITY.

Military Transport, see MOTOR TRANSPORT, MILITARY.

Militia (Lat. *miles*, a soldier) had the acquired meaning of the domestic force for the defence of a nation, as distinguished from the regular army. The M. was a constitutional force raised under the sanction of Parliament, in which the people, in theory at least, wagered their own bodies for the defence of their own souls, and in which they deputed the sole leadership and command to the sovereign and the Crown nominees. Organised by cos. and cities, it was essentially a local force; the property qualification for its officers connected it with the land, while the command of the sovereign effectually combined in it the interests of the three estates. Among the A.-S., no special organisation being adopted, efficiency was rarely attained. This the nation found

to its cost when the Danes overran it during Alfred's reign. That great king, to prevent a similar occurrence, reorganised the M. or *fyrd*, dividing it into two parts to ensure continuity of service, making land the basis of numbers, but the family system that of discipline. Each shire had not only to furnish its quota in time of war, but also to provide arms, keep them in repair, and to undergo so many days' training every year. When the Crown began to contend with the Norman barons it found an effective weapon in the revival of the Saxon M., and the Eng. yeomanry became thenceforth the fear of England's enemies and a guarantee for the gradual enfranchisement of the people. The shire contingent was commanded in pre-Conquest times by the ealdorman, later by the sheriff, and lastly by the (lord) Lieutenant, until 1871.

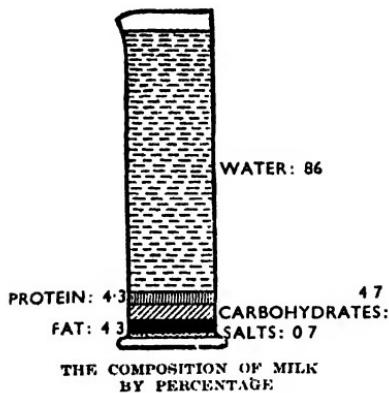
In 1601 James I. abolished the *fyrd*, and expanded and reorganised 'Trained (commonly called Train) Bands' (*q.v.*). The first stage of the Civil war of 1642 was a series of isolated struggles to secure the allegiance of the local M., and seize their magazines. An Act of 1662 reorganised the M., and this formed the basis of the M. law until 1908. Monmouth's infantry in 1685 consisted substantially of the M. or the W. cos. The M. was neglected until 1757, when, a large portion of the regular army being absent in the Seven Years war, it was organised for home defence. Several M. Acts were subsequently passed, notably those of 1701, 1786, and 1802. In practice M. were raised by voluntary recruitment, but if volunteering failed, a levy by ballot could be made upon all the inhab. of the locality between the ages of eighteen and fifty. The power of making this ballot always existed, and would have by law to be enforced by Parliament, but for the Militia Ballot Suspension Act, which, when the measure was unnecessary, was passed from year to year. Many classes were exempt from the ballot, as peers, soldiers, volunteers, yeomanry, resident members of univs., clergymen, par. schoolmasters, articled clerks, apprentices, seafaring men, Crown employees, free watermen of the Thames; in England any poor man with more than one lawful child; in Scotland any man with more than two lawful children, and not possessed of property to the value of £50; in Ireland any poor man not worth £10, or who did not pay £5 per annum for rent, and had more than three lawful children under the age of fourteen. The effect of this legislation was to transform the M. from a local police and national defence force into a reserve for the regular army. These earlier military functions were now fulfilled by the volunteers (*q.v.*), but against the wishes of the gov.; and from 1808 to 1812 a series of local M. Acts was passed to create a new compulsory home service force of men from eighteen to thirty. Like the general M., this force was recruited by M. authorities (in practice by par. officers); officers were required to be men of landed property, not necessarily an efficient method of selection.

To enable the maximum number of line regiments to proceed to the Crimean war and Indian mutiny, practically every M. regiment was embodied for home defence. In 1908, under the Territorial and Reserve Forces Act, a special reserve was formed which supplanted the M. The Militia Acts were not repealed, but the M. 'ceased to be raised in the United Kingdom.' The M. in Bermuda, Channel Is., and Malta were not affected by this change. In 1921 the Special Reserve was renamed the M., but it remained a part of the Army Reserve. In 1924 a new force was formed, the Supplementary Reserve. It forms such part of the Army Reserve as is in law M. (see CONSCRIPTION; RESERVE).

The M. of the U.S.A. is essentially a state and not a federal body. M. service was a feature of colonial life, and the same categories were liable to M. service in the 'plantations' as at home. The war with France in the New World was largely waged by the M. of the New England states and Virginia and New York. According to the M. law of 1903 the M. consists of every able-bodied male citizen of the respective states, and every able-bodied man of foreign birth who has declared his intention of becoming a citizen, who is more than eighteen and less than forty-five years of age. It is divided into two classes; the National Guard, which is the organised M., and the rest, which is called the Reserve M. The total strength of the National Guard of the forty-eight states is 682,048 (1948). This force consists of men who voluntarily enlist for military training and for peacetime service when called upon by the governor of their state to preserve order in case of strikes, riots, etc. In other words, the National Guard of each state is its own army, including an air component. The largest is that of New York State with a total ground force of 56,924 and an air force of 4536. The guard is organised on the same lines as the regular U.S. Army, and may also be called into service by the President of the U.S.A. Federal supervision is maintained by the National Guard Bureau. See further under UNITED STATES, Army.

Milk. Production of M. as a secretion of the female's mammary glands is the chief characteristic of the great animal div. mammalia. For young and growing animals it is a complete food, and necessarily, therefore, a highly complex mechanical mixture of a number of substances which vary not only with different species but also with individuals and breeds of domestic animals. Though the M. of goats is probably superior to any other for the artificial feeding of children, it is the M. of cows which is of chief economic importance. The greatest progress in the scientific study and treatment of M. has taken place since about 1890, and it is in connection with tuberculosis that the M. supply has received most attention. In 1913 the existence of tuberculosis in dairy cattle became compulsorily notifiable, slaughtered animals being compensated partly by the Treasury and partly from the local rates. This had a far-reaching

effect upon the purity of the Brit. M. supply. At the same time breeders of dairy cattle have worked steadily for the production of deeper milking cows. The milking machine is still far from being in general use, but is widely used in Australia, New Zealand, and America, and its use is increasing in Great Britain. The average milker's methods still fall short of a hygienic ideal, but the inspection of cow-sheds, dairies, and employees has considerably raised the hygienic standard. The M. should be drawn, after the udder has been cleaned with a damp cloth, with clean dry hands into a pail covered with muslin. Immediately afterwards, if it is to be sent away, the M. is passed through a gauze strainer into a cooler or refrigerator, in which it is reduced to a temp. about



two degrees above that of the water employed in the cooler, about five gallons of water being necessary to cool one gallon of M. The M. runs direct from the cooler into the railway churn, usually constructed to hold seventeen gallons, and, while allowing perfect ventilation, to be proof against dust, rain, or pilfering. For larger quantities, such as supply the big 'M. combines,' glass-lined tanks are used, each holding hundreds of gallons. All cans, churns, and other vessels should be sterilised by steam.

The delivery in glass bottles sealed with air-tight cardboard disks which can be used only once is now the rule. Under the Food and Drugs Act, 1899, the Ministry of Agriculture was empowered to state a standard for M. Contrary to the general idea, there is no such thing as a legal standard, but if on analysis M. is found to be inferior to the ministry's presumptive standard, it rests with the seller to prove that the M. was as yielded by the cow, and was not adulterated. This standard assumes the minimum percentage of solids, not fat, to be 8.5 per cent, and of fat 3 per cent. The grading of milk based on the number of bacteria present in one cubic centimetre of milk. The number used as a standard maximum

and the designation of the grades vary in different countries. The highest grade is certified as drawn from tuberculin-tested cattle, and has the smallest number of bacteria per cubic centimetre.

That tuberculous infection is widespread among cattle in Great Britain has been known since the report of the Cattle Diseases Committee in 1934, which also estimated that T.B. infection from milk was responsible for about 2000 deaths in England and Wales in 1931, quite apart from the ill-health it caused in many children. For many years the gov. seems to have allowed infected milk to be distributed to the pop. without taking drastic counteractive measures; but at length in 1943 the Ministries of Food and Agriculture announced their new policy in a White Paper (Cmnd. 6454). A long-term measure was the improvement of the national dairy herd by a sound breeding policy. But, more important in the short term was the new veterinary inspection of cattle herds. Up to 1943 herds producing tuberculin tested milk were tested periodically for tuberculosis and had to undergo a general veterinary inspection twice a year; herds producing accredited milk underwent a general inspection every three months, but were not tested for T.B.; but owing to the shortage of veterinary staff, a very considerable number of herds were not inspected at all. In the foregoing White Paper the gov. proposed to spread out the system of inspection to cover all herds. T.T. (i.e. tuberculin tested) herds continue to be inspected twice yearly, but accredited herds are only inspected a minimum of once a year where their milk is heat-treated before sale—if not, they are inspected every three months. All other herds are inspected once a year where the milk is heat-treated, and twice a year where it is not, with additional inspections of herds with a bad disease hist. Further, the responsibility for the conditions under which milk is produced, methods, buildings, and equipment, was transferred from local authorities to the Ministry of Agriculture. Further encouragement is given to the production and consumption of T.T. milk by an enhanced premium and official assistance in finding a market for the milk. In all areas that have had their milk deliveries rationalised the minister of food is empowered to make it an offence to sell milk unless it is heat-treated, T.T. milk, or milk from an accredited herd.

An order of the Local Gov. Board (now Ministry of Health) of 1912 prohibits the use of chemical preservatives in M., and the only methods of preservation, apart from the method of keeping clean and cool outlined above, are pasteurising, sterilising, and condensing. There are numerous devices for performing the operation invented by and named after Pasteur, in which the milk is usually heated to 145° F. In sterilising, M. is heated to much higher temp., usually to about boiling point—212° F.—three times for twenty minutes each, keeping the M. in the intervals at about 90° to permit the spores left behind to germinate. Con-

densing is performed by evaporating the water at a comparatively low temp. under reduced pressure. Another continues the process of evaporation until the solids are left as a fine powder, which has a pleasant sweet taste, and can be kept for a long time without deterioration. Much attention has of late years been attracted by soured M., which for many centuries has been used in E. Europe and Asia, and was recommended by Prof. Metchnikov. The M. is sterilised, and after cooling a culture of *Bacillus bulgaricus* is introduced. The use of this bacillus is being replaced by that of *Lactobacillus acidophilus* (see LACTIC ACID THERAPY). The soured M. thus obtained is about as thick as ordinary buttermilk; its flavour is pleasant and distinctive, and it is undoubtedly a very valuable food and gastric corrective. Goats' M. is sometimes given to people with delicate digestive systems, because the casein in it does not readily clot when acted on by the acid gastric juice. See also DAIRY; DAIRY FARMING.

See W. G. Savage, *Milk and Public Health*, 1912; W. C. Harvey and H. Hill, *Milk Products*, 1937; W. L. Davies, *Chemistry of Milk*, 1930; G. S. Wilson, *The Pasteurisation of Milk*, 1942; and the Ministry of Agriculture and Fisheries, *The Handling of Milk & Milk Products*, Bulletin No. 31.

Milk Chocolate, see under COCOA AND CHOCOLATE.

Milk Fever, name given to the febrile state sometimes occurring two or three days after child-birth, frequently brought about by a chill. It can generally be subdued in a few hours by the use of cooling saline draughts and by encouraging the free flow of milk.

Milk Fever in Animals. - The cow is the chief subject of this derangement, and is rarely attacked before the third calving. Its actual cause is uncertain, but is no doubt related to the artificial treatment of the animal. Schmidt introduced a remarkable treatment, which, with proper care, reduces loss to a minimum. When the distressing symptoms appear, the udder is milked out, and pure oxygen and filtered air are injected or pumped into each quarter of the udder.

Milk Marketing Board, was estab. in Britain in 1933 to meet the need of organised milk production and supply. The functions of the board are to fix prices, control distribution, and minimise waste.

Milk River, in the U.S.A., a trib. of the Missouri, rising in the Rocky Mts., near the N. boundary of Montana, and draining part of Canada. Total length about 475 m.

Milk Sugar, see LACTOSE.

Milkwort (*Polygala*), or **Rogation Flower**, genus of hardy annuals and perennials and hardy and tender evergreen shrubs. The common M., *P. vulgaris*, occurs on chalky heaths and bears terminal racemes of white, pink, or blue flowers. Other Brit. species include the large-flowered chalk M., *P. calcarea*, *P. amara*, with small blue flowers and fleshy leaves in a rosette, and *P. austriaca*, with large pink

flowers. Some of the hardy species are grown on sunny borders or rockeries. Sea M. is *Glaux maritima*, and belongs to the primrose family.

Milky Way, see GALAXY.

Mill, Hugh Robert (b. 1861), Scottish chemist and geographer, b. at Thurso. He became physicist and chemist to the Scottish marine station at Granton in 1884, and three years later was appointed a univ. extension lecturer. He has held successively the posts of librarian to the Royal Geographical Society, director of the Brit. Rajahal Association, honorary secretary and president of the Royal Meteorological Society. He was vice-president of the Royal Geographical Society from 1927 to 1931, and president of the Geographical Association in 1932. His publs. include *The Realm of Nature* (1891); *The English Lakes* (1895); and *The Siege of the South Pole* (1905). In 1907 he ed. the 4th ed. of the *International Geography* (1899). *Life of Sir Ernest Shackleton* (1923); *History of the Royal Geographical Society* (1930). His autobiography, *Life Interests of a Geographer*, was privately produced in 1945. Editor of *British Rainfall* and of *Symons's Meteorological Magazine* (1901-19). See life by J. Rattray, 1885.

Mill, James (1773-1836), Scottish philosopher and historian, son of a shoemaker, was b. at Montrose and, showing signs of ability, was sent to Edinburgh Univ. with a view to the ministry. He was licensed as a preacher in 1798, but gave up the idea of the church, went to London in 1802, and in that year became editor of the *Literary Journal*, and later of the *St. James's Chronicle*. From 1808 he earned his living as a contributor to the *Edinburgh* and other reviews, and by his *History of India* (1818). He was an enthusiastic supporter of Bentham, and a friend of Ricardo and other political economists. In 1821 he pub. the famous *Elements of Political Economy*, in 1829 his *Analysis of the Phenomena of the Human Mind*, and in 1835 a *Fragment on Mackintosh*, a bitter attack upon his brother philosopher. In 1819 he was given an official position on the board of control, on which he rose to be examiner, with a salary of £2000 a year. His writings belong to the utilitarian school, and he was perhaps the chief exponent of the utilitarian philosophy. See life by A. Bain, 1882.

Mill, John (c. 1645-1707), Eng. theologian, b. at Hardendale in Westmorland. In 1681 he became rector of Bletchington, Oxfordshire, and was made chaplain to Charles II. Four years later he became principal of St. Edmund's Hall, a position he retained till his death, and in 1704 was made a prebendary of Canterbury. His famous *Greek Testament*, pub. in 1707, was the fruit of thirty years' labour.

Mill, John Stuart (1806-73), Brit. philosopher and economist, was the eldest son of James M. (q.v.), the historian of India. Educated by his father, his studies embraced a range unusually wide. In 1823 he became a clerk in the India House, and was promoted until in 1856 he became the

head of his dept., and two years later, when the gov. of India was transferred from the E. India Company to the Crown, he declined a seat on the new council, and retired on a pension of £1500 a year. He entered Parliament as member for Westminster in 1865, but retired three years later. He was a founder of the Utilitarian Society (1823), from which developed the utilitarian movement, and of the Speculative Society (1826). In 1825 he ed. Bentham's *Rationale of Judicial Evidence*. His *Logic* was pub. in 1843, and made a profound impression; and in 1848 he pub. his *Principles of Political Economy*. Between the years 1858 and 1865 he wrote his treatises on *Liberty*, *Utilitarianism*, *Representative Government*, and his *Examination of Sir W. Hamilton's Philosophy*. This examination of Hamilton's philosophy has lost its interest so far as it is merely polemical, but it remains of great value as containing M.'s own theories on the relation of mind and matter. In particular his conception of physical objects as 'permanent possibilities of sensation' has had great influence on the development of the theory of knowledge. In 1865 he entered the House of Commons as a member for Westminster, where, though highly respected, he made no great mark. After this political experiment he returned to literary pursuits, and wrote *The Subjection of Women* (1869), *The Irish Land Question* (1870), and an *Autobiography*. His *Autobiography* gives a singular, and in some respects painful, account of the methods and opinions of his father in his education. Though remaining all his life an adherent of the utilitarian philosophy, M. did not transmit it to his disciples altogether unmodified, but, deeming it too narrow and rigid for his own intellectual and moral requirements, devoted himself to widening it, and infusing into it a certain element of idealism. M. typifies the philosophic radicalism of the Victorian era. He held that systems of laws and morals should promote 'the greatest happiness of the greatest number,' that education is the cure for all social evils, and that rational argument can ultimately convince humanity of what is good. Freedom of thought, of speech, and of the individual has found few stronger supporters; the theme of his *On Liberty* is that 'If all mankind minus one were of one opinion, and only one person were of the contrary opinion, mankind would be no more justified in silencing that one person than he, if he had the power, would be justified in silencing mankind.' His *System of Logic* is of great philosophic importance; it revives the question, which Hume raised, of the validity of scientific method, and upon it inductive logic is primarily based. His *Letters*, ed. H. Elliott, were pub. in 2 vols. 1910. See G. J. Holyoake, *John Stuart Mill, as some of the Working Classes knew him*, 1873; Notices of his life, ed. by H. R. Foxbourne, 1873; W. L. Courtney, *The Metaphysics of J. S. Mill*, 1879; A. Bain, *A Criticism* (with personal recollections), 1882; T. Gomperz, *J. S. Mill, ein Nachruf*, 1889; C. M. Douglas, *John Stuart Mill*:

A Study of his Philosophy (a most important work), 1895; Prof. W. Graham, *J. S. Mill*, 1899; Sir L. Stephen, *The English Utilitarians* (vol. iii.), 1900; J. MacCunn, *Six Radical Thinkers: J. S. Mill, etc.*, 1907; L. Roy, *Le Roman de J. S. Mill*, 1913, and *John Stuart Mill en Avignon*, 1921; H. Gehrig, *John Stuart Mill als Sozialpolitiker*, 1914; H. K. Garnier, *John Stuart Mill and the Philosophy of Mediation*, 1919; N. E. Himes, *The Place of John Stuart Mill and of Robert Owen in the History of English Neo-Malthusianism*, 1928; also lives by Mansfield Marston, 1873; W. L. Courtney, 1889; and S. Sanger (in Ger.), 1901.

Mill, see COTTON-SPINNING AND MANUFACTURE; FLOUR-MILLING; WOOL.

Mill, in law. The owner of a M. is entitled to the use of a stream undiminished in volume; if owners above interfere, he can sue them.

Millais, Sir John Everett (1829-96), Eng. painter b. at Southampton, son of John Wm. M., descendant of an old Norman family settled for many generations in Jersey. He showed no inclination for study but much aptitude for sketching at an early age. In 1838, on the strong recommendation of Sir Martin Archer Shee, P.R.A., his artistic future was decided, and in that year he began to study art at Sass's school in London. He won a silver medal from the Society of Arts in 1839, and in 1840 he passed on to the Academy schools, where he was awarded all the prizes. Ambitious of lifting native art from its dull level of conventional mediocrity, he joined the Pre-Raphaelite Brotherhood with his friend Holman Hunt. The banquet scene from Keats's *Isabella* (1849) was his first painting on Pre-Raphaelite principles. It reveals all the characteristics of Pre-Raphaelite work down to the close imitation of the smallest details of nature. He contributed to what has been styled 'the trilogy of Pre-Raphaelite art' his lonely and naturalistic representation of the child Christ in 'Christ in the House of his Parents,' better known as 'The Carpenter's Shop' (1850) (in the Tate Gallery). His unconventionality in this work produced a very unfavourable impression upon his critics, provoked much abuse, and even called forth an unmerited rebuke from Dickens. Ruskin, meanwhile, was championing M. with the rest of the Pre-Raphaelite band. With strict adherence to the Pre-Raphaelite style M. then produced 'The Return of the Dove to the Ark' (1851); 'Mariana of the Mounted Grange' (1851); 'The Huguenot' (1852); the universally admired 'Ophelia' (1852) (in the National Gallery), for which Mrs. Rossetti was the model; 'The Proscribed Royalist' (1853); and 'The Order of Release' (1853). Mrs. Ruskin, whom M. afterwards married, sat for this last-named picture. The after-glow in 'Autumn Leaves' (1856) and the moonlight in 'The Eve of St. Agnes' (exhibited in 1853) are two of his most splendid atmospheric effects, and may be said to belong to his transitional period. Other pictures of this period are 'Sir Isumbras at the Ford' (1857); 'The

'Escape of the Heretic' (1857); 'Apple-Blossoms' (1859); 'The Vale of Rest' (1859); and 'The Black Brunswicker' (1860). Meanwhile he illustrated Trollope's novels and Tennyson's poems (1860-1869), making altogether eighty-seven drawings for Trollope and establishing himself as the cleverest and most prolific illustrator of his time. He exhibited 'The Eve of St. Agnes' in 1863, 'Jephthah' in 1867, and 'Rosalind and Celia' in 1868. He then departed from the Pre-Raphaelite manner, forsook imaginative themes, and developed a strong individuality, with some of his finest pictures, many remarkable for their brilliant colouring,



SIR JOHN EVERETT MILLAIS

dramatic force, and expression of sentiment—such as 'The Boyhood of Raleigh' (1870) and 'Chill October' (1871). In his latter days he turned to portraits, landscapes, and single figures, as in child portraits such as 'Cherry Ripe,' 'Little Miss Muffet,' and the well-advertised 'Bubbles,' for which Adm. Sir Wm. James was the model; also a few figure pieces such as 'The North-West Passage' (1874); 'The Yeoman of the Guard' (1877); 'Effie Deans' (1877); and 'The Princess in the Tower' (1878). 'The North-West Passage' is sometimes considered his masterpiece; it represents an old sailor, painted from Edward John Trelawny, the friend of Byron, listening to a tale of Arctic exploration in a room overlooking the sea and littered with charts. His portraits include those of W. E. Gladstone, Tennyson, Cardinal Newman, Lord Beaconsfield, and Wilkie Collins. In 1885 he was created a baronet and in 1896 he became president of the Royal Academy. While he may not have possessed the imagination of an idealist his ability to depict

what he saw produced pictures of a dramatic power and brilliance which have seldom been excelled. See *Life and Letters* by J. G. Millais, 1899; lives by J. E. Reid, 1909, and A. Fish, 1923; and Sir W. James, *The Order of Release*, 1948.

Millar, John (1735-1801), Scottish prof. of law, b. at Shotts, Lanarkshire. He became an advocate in 1760, the following year being appointed prof. of law at Glasgow. He wrote *The Origin of the Distinction of Ranks* (1781) and *Historical View of the English Government from the Settlement of the Saxons in Britain to the Accession of the House of Stuart* (1812).

Millau, tn. in dept. of Aveyron, France, on the Tarn, manufs. gloves and wool. It was formerly a Huguenot stronghold. Notre-Dame and St. Francois, the latter with a Gothic belfry, are fine edifices. Pop. 17,600.

Millary, Edna St. Vincent (b. 1892), Amer. poetess and playwright, b. at Rockland, Maine, graduated from Vassar in 1917. She first won distinction with 'Renascence' (1912), pub. in 1917 as *Renascence and other Poems*, a poem in octosyllabic couplets. Living for a time in Greenwich vil., she wrote plays for the Provincetown Players, *Aria da Capo* (1921); *Two Slatterns and a King* (1921); and *The Lamp and the Bell* (1921). The first two are satirical fantasies, the last-named is a five-act drama on the theme of the strong mutual affection of two girls of the Middle Ages. For *The Harp-Wearer* she won the Pulitzer prize in 1923. This vol. is notable for its sonnets of disillusionment. Other writings include *The Buck in the Snow* (1923); *Fatal Interview* (sonnet sequence, 1931); *Wine from these Grapes* (1934); *Conversation at Midnight* (1937); *Huntsman, What Quarry?* (1939); and *There are no Islands any more* (1940).

Millbank Prison. This prison was erected (1813-16) on a site on which the Tate Gallery now stands, and was a direct outcome of the philanthropic teaching of Howard. The old vindictive or retributive theories of punishment found expression in prisons that were veritable Alsatias of squalor; the schemes of Howard, and later of Bentham, looking to the reformative utility of imprisonment, advocated the erection of places that should fulfil the idea of penitentiaries. The gov. of the early years of last century, impressed by the arguments of prison reformers, accordingly purchased land at Millbank, and at great cost erected the Millbank penitentiary on the methods which Bentham had described in his *Panopticon* (1791). The system failed dismally; and in 1843 there was a partial reversion to older methods. From 1870 to 1890 M. P. was a military prison. See A. G. F. Griffiths, *Memories of Millbank*, 1875.

Millboard, tough, thick, and rigid pasteboard made from pulp. As in the case of paper, the material varies with the quality; waste paper and wood pulp give a poor quality, the better kinds having more fibre supplied from rags, rope, sacking, and hemp. The finer qualities used by artists are bleached and glazed.

Coarser types are used for bookbinding, partitions, etc.

Millbury, tn. in Massachusetts, U.S.A., 7 m. from Worcester. It has cotton and woollen mills. Pop. 6,900.

Milledgeville, city of Baldwin co., Georgia, U.S.A., has grist and cotton-seed oil mills. Named after John Milledge, one-time governor of Georgia, and was once the cap. of that state. Here is the Georgia State college for women, the State lunatic asylum, and penitentiary. Pop. 6,700.

Millennium, period of 1000 years during which it was believed the kingdom of Christ would be estab. on earth. The idea originated in Judaism, but it was also very popular among the early Christians, who looked forward to the Parousia, or second coming of Christ. Indeed, in the first century of the church, chiliasm (Gk. χιλίοι, thousand) was a widespread belief, to which the books of Daniel and the Apocalypse gave authority; whilst such books as the *Testament of the Twelve Patriarchs*, the Christian Sibylline books, etc., and the writers, Papius of Hierapolis, Irenaeus, and Justin Martyr gave vivid descriptions of the glory and magnificence of the M. According to them, it would be a time when all flaws in human existence would have vanished and perfect happiness prevail. But this period of bliss was to be preceded by great calamities and the triumph of the Messiah over Antichrist. The Rom. Empire was to be destroyed, Satan put in bonds, and the kingdom of Christ estab., when the righteous would arise from the dead and live, together with the surviving saints, with the Messiah in the New Jerusalem, a city which would literally descend from heaven. But lapse of time tended to stifle this belief, and when the Alexandrian philosophers, and amongst them Origen, introduced the idea that there would be no final conflict between Paganism and Christianity, but a gradual spread of truth throughout the world, dreams of chiliasm began to fade. Millenarianism, however, had some revival at the period of the Reformation, being adopted by the Anabaptists, who regarded the pope as Antichrist; and in Cromwell's time the Fifth Monarchy Men (q.r.) were millenarians. It flourished, moreover, during the Thirty Years war, and still persists in various forms. See also ADVENTISTS. See G. Calixtus, *De Chiliasm cum antiquorum pridem renato*, 1692; A. Corrodi, *Kritische Geschichte des Chiliasmus*, 1794; J. Bossuet, *Religion des Judentums*, 1926; and W. Rigg, *Das ewige Reich*, 1944.

Miller, Hugh (1802-56), Scottish geologist, was b. at Cromarty, where in 1860 his memory was honoured by a monument to his name. By trade M. was a stone-mason, and it was only by being a stern 'taskmaster of his own energies' that he acquired that literary style and scientific learning which won him renown. After publishing *Poems* (1829) and *Legends* (1835) he became in 1839 editor of the bi-weekly *Witness*, and in its columns appeared a series of strikingly original geological essays, afterwards embodied in

The Old Red Sandstone (1841). His autobiography, *My Schools and Schoolmasters*, was pub. in 1852.

Miller, Joaquin (né Cincinnati Heine Miller) (1842-1913), Amer. poet, b. in Indiana, and spent his later boyhood in Oregon. For four years (1868-70) he was judge in Grant co., and later he visited Europe many times (1870-76), and also Klondyke (1897) and the Orient (1899). He made his name with his passionate *Songs of the Sierras* (1871), and, besides writing other poems and a melodrama of Mormonism, *The Danites* (1880), pub. a *History of Montana* (1886), and *The Building of the City Beautiful* (1887), some ideas of which he attempted to put into practice in a social community on his estate. See life by M. S. Peterson, 1937.

Miller, Joseph, or Josiah (1684-1738), popular Eng. comedian of his day, who could neither read nor write. John Motley compiled a book of fact-life in 1739, which he called *Joe Miller's Jests* without, however, obtaining M.'s permission for the liberty. A stule jest is still sometimes called a 'Joe Miller.'

Miller, William, see ADVENTISTS.

Miller, William Hallows (1801-80), Brit. mineralogist, b. at Velindre, in Pembrokeshire, and educated at St. John's College, Cambridge, becoming a fellow in 1829. His chief work was *Crystallography*, pub. in 1838.

Millerand, Alexandre (1859-1913), Fr. statesman and advocate, son of a wine merchant. B. in Paris, he was educated at the Lycée Henri-Quatre and at the Lycée Michelet. He became a journalist on the *Indépendant*, later working under Clemenceau on *Justice*. In 1881 he became an *avocat* of the court of appeal. In 1885 he entered the chamber, where he soon became conspicuous by supporting the aims of labour and social reform generally, and was made minister of commerce in Waldeck-Rousseau's Cabinet (1899-1902). In 1909-10 as minister of public works he performed valuable work during a serious railway strike, and again at the time of the inundations. His reforming zeal was equally marked during the time he was war minister (1912-13; 1914-15). In 1920 he became Prime Minister, and eight months later president of the Fr. Republic. But he was soon at loggerheads with the Radical and Socialist (Left) majority, which, under Briand, had triumphed in the 1924 elections. Though re-elected to the Senate in 1927, his influence waned. His pub. books, which are all political, include *Socialisme réformiste en France* (1903); *Pour la défense nationale* (1913); and *La Guerre libératrice* (1918).

Miller's Thumb, see BULLHEAD.

Milles, Vilhelm Carl Emil (b. 1875), Swedish sculptor, b. near Uppsala, and studied in Paris. His best work consists of portrait busts, and animal groups, as well as fountains and monuments in Stockholm, Chicago, and other cities. See monograph by F. Verneuil, 1929.

Millet, Aimé (1819-91), Fr. sculptor, b. in Paris, achieved fame in 1857 with his statue of 'Ariadne,' which was bought for

the Luxembourg, Paris. This was followed by 'Mercury,' now standing in the court of the Louvre, and the famous 'Vercingétorix,' a colossal statue in beaten copper at Alise-Sainte-Reine in Côte-d'Or (1865). Other works are the 'Apollo' surmounting the Grand Opéra, 'Tombeau de Baudin,' and a monument of P. F. Dorian, politician (1814-73), at Père-Lachaise.

Millet, Francis Davis (1846-1912), Amer. artist, b. at Mattapoisett, Massachusetts, U.S.A. In 1898 he went to Manila as war correspondent for *The Times* and *Harper's Weekly*. In 1895 he was elected a member of the National Academy, New York. His best-known pictures are 'Between Two Fires,' in the Tate Gallery, London; 'A Cosy Corner,' and 'At the Inn.'

Millet, Jean François (1814-75), Fr. painter, was the son of a peasant of Gruchy, near Gréville (La Manche). Like Burns, he turned to his art after toiling in the fields; in 1836 he became a pupil of Mouchel in Cherbourg, and two years later entered the studio of Delaroche in Paris. After many vicissitudes he secured a notable success with 'The Winnower,' exhibited at the Salon in 1848; 'Sowers and Binders' (1850); 'The Reapers' (1854); 'The Gleaners' (1857, now in the Louvre); 'The Angelus' and 'Death and the Woodcutter' (1859), are some of his finest works. M. was a master in depicting the sombre melancholy of work and rustic peasant life, a melancholy often emphasised by twilight atmosphere most sensitively expressed. See *Lives* by A. Sensier (Eng. trans., 1881); J. Cartwright (2nd ed.), 1896 (with letters); J. C. Ady, 1910; and L. Osell, 1928.

Millet, seed of some species of *Panicum*, which are extensively cultivated in India and Africa, and also in S. Europe, being especially well suited to growth in a dry, sandy soil. The common M. is *P. milaceum*; the little M. *P. miliare*; the It. M. comes from *Setaria* or *Chenophaea italicica*, and has been generally cultivated in Asia from remote times. Pearl M., *Pennisetum glaucum*, grows in tropical Africa and India. Indian M., Kaffir or Guinea corn, is *Sorghum vulgare*, whose grain is known as durra. M. seeds are round, and vary in size and in colour from yellow to white, grey, brown, red, and black. M. is much used in food for poultry, pigeons, and cage birds. Ms. are grown largely where conditions are unfavourable for maize, and M. flour provides a staple food for large sections of the native pop. in S. Africa, N. and S. Rhodesia, the E. African ter., and in the interior of W. Africa. Production is almost entirely in the hands of natives. The great M. or sorghum is the most important M. crop, but in drier areas the lesser Ms., such as *pennisetum*, the bulrush M., and *eleusine*, are widely grown, both as pure and mixed crops. Sorghum is an important crop in the Union of S. Africa and in the high commiss. ter. (Bechuanaland, Basutoland, and Swaziland). Basutoland alone producing nearly 30,000 tons; Nyasaland and N. Rhodesia also depend very largely on Ms. for food. In Tanganyika they are the staples for food and brewing of beer.

Sorghum is also grown extensively for food in Kenya, and in parts of Uganda *eleusine* is the staple cereal. In N. Nigeria the prin. grain crops are bulrush M. (or gero) and sorghum. In Fr. W. Africa Ms. are the staple food throughout the N. areas, and also in the palm belt in Dahomey (Lord Hailey, *An African Survey*, 1938).

Milletia, genus of climbing trees and shrubs (family Leguminosæ) with pink and purple flowers.

Hill Hill, dist. of Greater London, 8 m. N.W. of the city, between Edgware and Tottenham, on the London Midland and E. Region railways. It is included in the bor. of Hendon. M. H. public school was founded in 1807 as a school for the sons of Nonconformists, but was reorganised on broader lines in 1869. The Jesuits have a training college at M. H. Pop. 17,100.

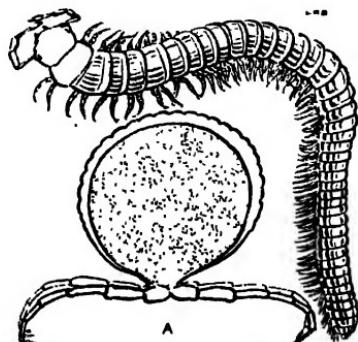
Milliard, word very rarely used, signifying a thousand millions; in America often termed a billion.

Millibar (abbreviation mb.), unit of atmospheric pressure used in meteorology. It is defined as one-thousandth part of a bar, which is equal to 1,000,000 dynes/sq. cm. (a dyne is the absolute unit of force in the centimetre-grain-second system of units). The mean atmospheric pressure at sea level over the whole globe is about 1013 mb. At 0° C., in lat. 45°, 1000 mb. is equivalent to a height of 750.1 mm. or 29.531 in. of mercury.

Millikan, Robert Andrews (b. 1868), Amer. physicist, b. at Morrison, Illinois, son of the Rev. Silas Franklin M. Graduating at Oberlin, 1891, he gained a Ph.D. at Columbia, 1893, and then studied at Berlin and Göttingen, 1895-96, returning to Chicago Univ. as an assistant to Michelson (q.v.). Prof. of physios., univ. of Chicago, 1896-1921, he has been since then director of the Norman Bridge Laboratory of Physics and chairman of the Executive Council of the California Institute of Technology, at Pasadena. He was vice-chairman, National Research Council, Washington, from 1917, and in 1918 was a lieutenant-colonel in the U.S. Signal Corps. He became famous as a result of his ingenious researches that led to the most exact evaluation of the charge of the electron, and to the view that the electron is the fundamental unit of negative electricity (see his *The Electron*, Chicago Univ. Press, 1917). M. was awarded the Nobel prize in 1923 for his work on electrons. His pubs. include *The Electron: its Isolation and Measurement, and the Determination of some of its Properties* (1921); *Evolution in Science and Religion* (1927); *Science and the New Civilisation* (1930); *Time, Matter, and Valors* (1932); *Cosmic Rays* (1939); and *Electrons, Protons, Photons, Neutrons, and Cosmic Rays* (revised ed. 1946).

Millin, Aubin Louis (1759-1818), Fr. archaeologist, botanist, and numismatist, b. in Paris. He became prof. of hist. and physics at the École Centrale, and at the Lycée of Paris in 1794. His pubs. include *Antiquités nationales* (1799) and *Voyages dans les départements du midi de la France* (1807-11), etc.

Millin, Sarah Gertrude (née Liebson) (b. 1889), S. African authoress of Jewish descent. Married a judge of the Supreme Court of S. Africa. She has written good biographies of Rhodes (1933) and Gen. Smuts (2 vols., 1936), and her own autobiography, *The Night is Long* (1941). Her numerous novels of S. African life include *The Dark River* (1920); *Adam's Rest* (1922); *The Jordans* (1923); *Mary Glenn* (1925); *The Coming of the Lord* (1928); *Three Men Die* (1934); *Whad Hath a Man?* (1938); and *The Herr Witchdoctor* (1941). Other works include *The South Africans* (1926, 1934); *South Africa* (1941, Brit. Commonwealth in Pictures series); and a *War Diary* in three vols. (1944-46).



MILLIPEDE

A, single segment; transverse section, highly magnified.

Millinery. This term is generally used to designate women's hats and their trimmings (ribbons, lace, feathers, artificial flowers, etc.), and is also applied to the art of making and trimming hats and bonnets. Originally the word meant 'Milan goods,' such as textile fabrics, gloves, ribbons, 'Milan bonnets,' needles, and cutlery. Many articles of M. are sold by haberdashers and drapers. Milliners are those who make and trim hats and headgear of all descriptions for women and children (as opposed to 'hatters,' who make headgear for men), and are nearly always women. See also HATS.

Milling Machines. Term 'milling' means the process of removing metal from a surface by means of rotary cutters fixed in a M. machine. Mass-production has been made possible by the rapid development of M. M. during the present century, for they are able to make perfect reproductions in any quantities of parts of machinery, and, moreover, can perform such operations quickly. There are numerous types of M. M. designed for the great variety of work required in modern machinery. The Universal M. machine is used for the production of twist drills, for various kinds of gear-wheels, as well as for straight and taper milling. Plano-millers

are used for big jobs, such as the milling of the cylinders of motor cars, while other types of M. M. are circular millers and thread millers for cutting screw threads. Many M. M. to-day are completely automatic, and by employing different cutters mounted on separate spindles they can deal with a job that requires various types of milling.

Milling Process, see under MINING.

Millipedes, or Millepedes (order Chilognatha), small, active animals forming with the centipedes the class Myriopoda (many-footed). They are vegetarian in habit, and though they consume much decaying matter, they also damage and destroy cultivated plants. Common species are *Julius guttatus*, *J. terrestris* (sometimes called wire-worm), and *J. pulchellus*. Trapping by means of buried roots and dressing the ground with lime or soot are methods of keeping M. in check.

Millom, tn. of Cumberland, England, 9 m. from Barrow, has smelters, red hematite and iron ore mines, and blast furnaces. Pop. 9000.

Millport, watering-place on Great Cumbrae Is., Bute, Scotland, has a good sandy beach and fine harbour. There is a marine research station where oyster breeding is carried on. Pop. 2300.

Mills Bomb, see BOMB: (GRENADE).

Millsprings, hamlet of Wayne co., Kentucky, U.S.A., 80 m. S. of Lexington. Here the Confederates under Crittenden were defeated by the Union forces under Thomas in 1862.

Millstones. These consist mostly of sandstone and various kinds of grit, but they have the disadvantage of becoming smooth and thus necessitate dressing from time to time. The best stone to use is one which is hard and porous; perhaps the best stones fulfilling these conditions are the Fr. burr stones. Of late years steel rollers have largely displaced those of stone.

Milltown, tn. in New Brunswick, Canada, on the St. Croix R., 62 m. W. of St. John. Pop. 3000.

Millvale, bor. of Allegheny co., Pennsylvania, U.S.A., on the Allegheny R., opposite Pittsburgh. Pop. 7800.

Millville, city of Cumberland co., New Jersey, U.S.A., 35 m. S. of Philadelphia. It manuf. cottons, glass ware, iron goods, etc. Pop. 14,800.

Millwall, dist. of London, on the N. side of the Thames, in the Isle of Dogs, and the bor. of Poplar. It is bounded on the S. by the M. dock (230 ac.), the centre of the London grain trade. The name originated from seven windmills, which stood on the wall built there to keep the riv. from overflowing its banks at high tide.

Milman, Henry Hart (1791-1868), English divine and historian, was a son of the physician Sir Francis M., Bart. He was educated at Eton and Brasenose College, Oxford. He took holy orders, and was in 1818 presented to the living of St. Mary's, Reading. He was prof. of poetry at Oxford from 1821 for ten years, and in 1827 was appointed Bampton lecturer. Rector of St. Margaret's, Westminster, and canon of Westminster from 1835, in 1849 he

became dean of St. Paul's. Among his earlier writings were *Fazio* (1815), a play produced in 1818 with great success; an epic poem, *Samor, the Lord of the Bright City* (1818), and a dramatic poem, *The Fall of Jerusalem* (1820). In 1838 he ed. Gibbon, and in the following year pub. a life of the historian. The works upon which his fame rests are his *History of the Jews* (1830); *History of Christianity under the Empire* (1840); and *The History of Latin Christianity down to the death of Pope Nicholas V.* (1855). See life by A. Milman, 1900.

Milne, Alan Alexander (b. 1882), Eng. journalist and playwright, began journalism in London in 1903, and was assistant editor of *Punch* from 1909 to 1914, contributing a number of pleasing articles in a light bantering vein. He pub. *The Day's Play* (1910); *Once a Week* (1914); *Mr. Pim* (1921); *If I May* (1922); *A Gallery of Children* (1925); *Four Days' Wonder* (1933); *Peace with Honour* (1934); *Behind the Lines* (1940); *War Aims Unlimited* (1941); *Once on a Time* (1943); *Chloe Marr* (1946); and *The Norman Church* (poem, 1948). His most successful work is in his tales for children, *Winnie-the-Pooh* (1926) enjoying great popularity. One of his best plays is *Mr. Pim Passes By* (1919); others are *The Romantic Age* (1920); *The Truth about Blaids* (1921); *The Ivory Door* (1927); *Other People's Lives* (1932); *Sarah Simple* (1937); and *Gentleman Unknown* (1938).

Milne, Edward Arthur (b. 1896), Brit. scientist, b. at Hull; was educated at Hymers College, Hull, and Trinity College, Cambridge. He was successively assistant director of solar physics at Cambridge observatory, 1920-21; lecturer in mathematics, Trinity College, 1924-25; Rouse Ball prof. of mathematics, Oxford, and fellow of Wadham College, 1928. Noted for his researches in astrophysics, he wrote *Equilibrium of the Chromosphere* (1924); *Thermodynamics of the Stars* (1930); *The White Dwarf Stars* (1932); *Relativity, Gravitation, and World Structure* (1935), a new theory of the universe, for which he was awarded the Royal Astronomical Society's gold medal; *Foundations of Dynamics* (1936); *Electromagnetism* (1938). He was president of the London Mathematical Society, 1937-1939, and has gained many academic distinctions in Britain and the U.S.A.

Milne, John (1850-1913), Eng. seismologist and mining engineer, educated in Rochdale, Liverpool, and London. He was employed as geologist in Dr. Beke's expedition to N.W. Arabia, 1874. He then served the Jap. Gov. for twenty years, establishing the seismic survey of Japan (968 stations). M. travelled widely in Russia, China, Borneo, the Australian colonies, U.S.A., and elsewhere. For the Brit. Association he estab. a seismic survey of the world. His works include *Earthquakes* (1883); *Seismology* (1888); and *The Miner's Handbook* (1894).

Milne-Edwards, Henri (1800-85), Fr. naturalist, b. at Bruges, son of an Englishman. He succeeded Cuvier as member of the Académie des Sciences (1838), was

prof. of entomology at the Jardin des Plantes (Muséum d'Histoire naturelle, 1841), and prof. of zoology and physiology (c. 1861). He ed. the *Annales des sciences naturelles* (1834-84); and contributed largely to it, and to the *Dictionnaire classique d'histoire naturelle*. His works include *Éléments de zoologie* (1834, 1851); *Histoire naturelle des coralliaires* (1857-1860). His monumental *Leçons sur la physiologie et l'anatomie comparée de l'homme et des animaux* (1857-81) was compiled with his son Alphonse (1835-1900).

Milne of Salonika and of Rubislaw, Sir George Francis, first Baron (1866-1948), Brit. field marshal, son of George M., of Westwood, Aberdeen. Joining the army in 1885, he served in the Sudan, 1898, and S. Africa, 1899-1902. When the First World War began he was brigadier-general commanding 4th divisional artillery. He served in France, became major-general, 1915, and commanded 27th Div. and 16th Army Corps. At the end of 1915 he was with the Brit. forces at Salonika; and from the following May commanded the whole Brit. contingent in Macedonia. He served under various Fr. commanders-in-chief in the Near E. till the Ger. surrender, remaining with the command until 1920. At home he held the E. command, 1923-28, and became field marshal, 1928, and chief of imperial general staff, 1926-33, being raised to the peerage, 1933. Governor and constable of the Tower of London, 1933-38.

Milner, Sir Alfred, Viscount (1854-1923), Brit. colonial administrator; b. March 23 at Glessen, Germany, son of Charles Milner, M.D. He was educated at Tübingen Univ., King's College, London, and Balliol College, Oxford, where in 1877 he graduated with first-class honours in classics. For four years, 1881-85, he devoted himself to journalism, writing chiefly for the *Pall Mall Gazette* under John Morley and W. T. Stead. He owed his appointment as under-secretary for finance in Egypt, where he remained for four years, 1889-92, to G. J. Goschen, chancellor of the exchequer, whom he had already served as private secretary, 1887-1889. His statesmanship was first put to a serious test when, after fulfilling admirably the functions of chairman to the Board of Inland Revenue, 1892-97, and being made K.C.B., 1895, he was made governor of Cape Colony and high commissioner for S. Africa in 1897. There is no doubt that his determination to secure for the Brit. subjects of the Transvaal that political freedom which the Dutch alone enjoyed helped to precipitate the war which broke out between the Eng. and the Boers in 1899; and this, combined with the unexpected disasters that overtook Brit. troops, accounts for the organised opposition with which he met on his return home in 1901, when he was made Baron M. But the resentment that his administration had raised, so far from securing his dismissal from S. Africa, was promptly met by his appointment as governor of the Transvaal and Orange

River colonies. This post he retained till 1905. He was made viscount in 1902; and in 1903 he sanctioned the importation of Chinese labour to work the mines, a sanction which subsequently involved him in a storm of adverse criticism. He was strongly opposed to the granting of self-government to the new colonies. On his return to England he took a leading part in the rejection of the 1909 budget.

In his *England in Egypt* (1892) he gave a clear account of the results of the British occupation. Pub. *The Nation and the Empire* (1913). Before the First World War broke out he made it clear that he would enter no govt. that did not pledge itself to conscription. At the formation of the first coalition, in the spring of 1915, he became chairman of the committee on agriculture. Member of War Cabinet, without portfolio, 1916–18, he went with Lloyd George to Rome, Jan. 1917, and immediately afterwards to Russia, returning before Nicholas's abdication. Secretary for the colonies, 1919–21, he visited Egypt and reported on necessary changes; his report being neglected he resigned. He pub. *Questions of the Hour* in 1925. See C. Headlam (ed.), *The Milner Papers, 1897–1905*, 1931–33; E. A. Walker, *Lord Milner in South Africa*, 1942; and V. Halperin, *Lord Milner et l'imperialisme britannique*, 1947.

Milner, Sir Frederick George, seventh Baron (1849–1931), second son of Sir Wm. Mordaunt Edward M., fifth Bart., of York, and educated at Eton and Christ Church, Oxford. From 1890 to 1906 he was M.P. for the Bassettlaw div. of Nottinghamshire. Privy councillor in 1904. What he observed at the close of the S. African war made him the champion of the common soldier in and after the First World War. Chiefly through his efforts the administration of pensions was transferred from the commissioners of Chelsea Hospital to a specially created ministry. He founded the first recuperative hospital for the shell-shocked at Hanapstead. When this was no longer necessary its funds were transferred to Enham vil. settlement, afterwards united with Papworth (q.v.) settlement, M. identifying himself with this movement for the benefit of tuberculous patients from army and navy.

Milnes, Richard Monckton, see HUGHTON, BARON.

Milngavie (locally pronounced Millguy), police burgh of Scotland, in Dumbartonshire, 6 m. N.N.W. of Glasgow. There are bleach works, distillery, and dye-works, and a paper-mill. Pop. 6300.

Milnrow, tn. of Lancashire, England, 1½ m. S.E. of Rochdale, with a trade in woollen goods and collieries. Pop. 8200.

Milo, or Milon, Gk. athlete who flourished in the latter part of the sixth century B.C., b. at Crotona, Magna Graecia, Italy. He was famous for his prodigious strength, and became a pupil of Pythagoras. At the Olympic and Pythian games he was twelve times victor at wrestling. He defeated the Sybarites in 511 B.C.

Milo, Titus Annius, Rom. tribune, came

into office in 57 B.C. He was a partisan of Pompey, and aided Cicero's recall from exile, thus incurring the hostility of Clodius, whom he killed in a fray (53 B.C.). The next year he was tried for homicide, and was condemned and exiled to Marcellis. See Cicero, *Oratio pro Milone* (Reid's ed.), 1906.

Milo, tn. in Maine, U.S.A., on the R. Piscataquis, 30 m. N.N.W. of Bangor, has quarries of roofing slate. Pop. 3000.

Milo, is. in the Aegean Sea, see MELOS.

Milovanovich, Milovan (1863–1912), Serbian statesman, educated at Belgrade and at Paris, where he became doctor of law. He was appointed prof. of law at the univ. of Belgrade. In 1908, being then Serbian minister at Rome, was appointed minister of foreign affairs, and made a tour of European caps, during the tension that followed Austria's annexation non-party premier in 1911.

Milreis, former name of the Brazilian currency unit. For many years Brazil had a dual currency, with a gold M. (100 reals or reis) for foreign trade and a paper M. for domestic trade. At one time the gold M. was worth 27d., but fell to 15d. before the First World War, to 5·93d. in 1929, and to 2·78d. in 1938. From Nov. 1, 1942, the currency unit was renamed the cruzeiro (Cr \$), composed of 100 centavos. Metalllic currency now consists of 1, 2, and 5 cruzeiros and 10, 20, and 50 centavos: notes are of the value of 10, 20, 50, etc., up to 1000 cruzeiros, all resembling the former notes for similar amounts of M. One thousand M. or cruzeiros is known as 1 conto, roughly equivalent to \$0.70, U.S. In 1946 Brazil informed the International Monetary Fund that its exchange rate would be 18·96 cruzeiros to the dollar, making the cruzeiro equal to 5·27 cents.

Milt, see PISCICULTURE.

Miltiades (c. 540–c. 488 B.C.), famous Athenian general and victor of Marathon: son of Kimon, and nephew of M. the Okist. After the Scythian expedition of Darius M. had to leave as a result, according to Grote, of incurring the hostility of Darius, but was at the Chersonesus continuously from the outbreak of the Ionian revolt until about three years before the battle of Marathon. Was one of the four out of the ten Athenian generals who strongly advised the Polemarch, Kallimachus, to give immediate battle to the Persians, instead of retreating behind the walls of Eretria, and crowned his career by winning the battle of Marathon. Later he was entrusted with the expedition against Paros, but apparently used the occasion merely to vent a private spite against a Parian citizen, Lygagoras. Was impeached on his return by Xanthippus, father of Pericles, but d. soon afterwards, leaving the fine to be paid by his son Kimon.

Milton, John (1608–74), one of the most illustrious of Eng. poets, was b. in Bread Street, London, the son of John M., a scrivener. His father, who instructed him in music, and is said to have made him a skilful organist, had him taught by a private tutor, Thomas Young, a

Scots clergyman, who eventually became master of Jesus College, Cambridge. M. was also sent to St. Paul's School, not later than 1620. He took to study passionately and, besides Lat. and Grk., he appears to have learned It., Fr., and some Heb., and to have read much Eng. literature. According to tradition he began to write poetry at the age of ten, and while at the univ. he wrote verses on current events and, *inter alia*, the sonnet on Shakespeare and the *Ode on the Nativity*. He was admitted a pensioner of Christ's College, Cambridge, on Feb. 12, 1625, and matriculated on the following April 9. His tutor at Cambridge was Wm. Chappell, who later became bishop of Cork. It was at one time intended that M. should study law, but he inclined to letters, and was allowed to follow his bent. He graduated M.A. on July 3, 1632, having taken his B.A. degree on March 26, 1629. From 1632 he lived with his father at Horton for six years, and during this period wrote *L'Allegro* and *Il Penseroso*, and the masques *Arcades* and *Connus*. The exquisite *Lycidas* was written in 1637, on the death of Edward King. M.'s mother d. in 1637, and was buried in Horton church. His father was at the same time charged by a client with misconduct in respect of funds entrusted to him for investment, but was completely exonerated by the court.

M. now obtained his father's consent to undertake a journey abroad and, in the following year (1638), he spent about a year in Italy, Switzerland, and at Paris. The dates of his sojourn are fixed by the short account of his travels in the *Defensio secunda* (1654) and references in his *Poems upon Several Occasions* (4th ed., 1703). His reception by distinguished hosts demonstrates the impression made on his contemporaries by his lofty character, prepossessing appearance (at Cambridge he had been nicknamed 'the lady' on account of his beauty and delicacy of mind) and literary culture. Among others he met Grotius, Galileo, Malatesti, and Manso, the patron of Tasso. On his return he settled in London, took two nephews as his pupils, and entered into an acrimonious theological controversy with Bishop Hall, his prin. writings being *The Reason of Church Government urged against Prelacy*, and an *Apology*, both written in 1642. In the following year he married a girl of seventeen, Mary, eldest daughter of Richard Powell (a 'joyful and free-living cavalier' of Forest Hill, near Shootover, Oxfordshire, who is said to have acknowledged, in 1627, an undischarged debt to M. of £300), who, finding life dull with the eminent but dour Puritan, went within a month of the nuptials on a visit to her father, and refused to return. Thereupon M. wrote a pamphlet on *The Doctrine and Discipline of Divorce* (1643), and followed this with *The Judgment of Martin Bucer concerning Divorce* (1644). His views on divorce made him notorious and his writings on it only ended in 1644–45 with the pamphlets *Tetrachordon* and *Colasterion*. He was attacked by the Stationers' Company for publishing pamphlets without

licence, and in reply wrote *Areopagitica* (1644), a spirited vindication of the liberty of the press, which brought him into great prominence, and gave him a position as a man of letters that had not hitherto been assigned to him. In 1646 his wife returned to him, and within six years bore him four children, dying in giving birth to the last, a son, who d. in infancy. He sided with the army against the king, and after the execution of Charles I. pub. the *Tenure of Kings and Magistrates* (1649), in which he espoused the popular side. The surrender of Oxford in 1646 completed the ruin of Powell, who d. in 1647, leaving a will which proved that his affairs were desperately confused and M., who had an 'extent' on Powell's mortgaged estate, found himself in dispute



JOHN MILTON

with his mother-in-law over the allowance for her family. M. entirely sympathised with the army in their triumph over the parl. and Presbyterian party, and he shows this sympathy in his sonnet to Fairfax upon the siege of Colchester, written in 1648, in which year he was also occupied in compiling the *History of Britain*, of which he had written four books (*Defensio secunda*), when he was recalled to public affairs by the events which led to the execution of the king.

In 1649 he became Lat. secretary to the council of state, and in his official capacity answered Gauden's *Eikon Basilike* with *Eikonoklastes*. He became blind, and had to be assisted by secretaries, the most important of whom was Andrew Marvell, but he retained his post until the Restoration, during which period he wrote seven pamphlets, and just before the return of Charles II. pub. *The Ready and Easy Way to establish a Free Commonwealth* (1660). M. was now in considerable danger, for the Royalists were very naturally incensed against him. The House of Commons ordered that his *Defensio* should be burnt by the common hangman, and that he

should be arrested. He had gone into hiding, but was taken prisoner. The Act of Indemnity, however, put an end to his troubles.

M. had married a second time in 1658, but this wife dying two years later, he married Elizabeth Minshull in 1663. He now lived at Chalfont St. Giles in a cottage that still exists, and there he settled down to complete the great work that had long been in his mind. *Paradise Lost* was begun in 1658 and, according to Aubrey, was finished five years later, though it was not pub. until 1667. He received £10 for the work, and his widow subsequently received another £8. Thirteen hundred copies were sold in eighteen months. The poem was acclaimed by the few, but it did not at once bring the author the great fame that is his to-day. When M. showed Thomas Ellwood the MS. of *Paradise Lost* Ellwood remarked: 'Thou hast said much here of *Paradise Lost*, but what hast thou to say of *Paradise Found*?' M. may have taken the hint, or he may have already planned *Paradise Regained*, which was pub. in 1671. In the same year appeared his last important work, *Samson Agonistes*, a drama on the Gk. model, but not adapted for theatrical representation. He d. on Nov. 8, 1674, and was buried in St. Giles, Cripplegate.

M. stands high among Eng. poets, and is second only to Shakespeare himself. His splendid vocabulary, his swinging rhyme, and majestic diction are unrivaled. He demands reverence rather than love, for he is, above all things, austere. Love touched him not, and of humour he had not a spark. Yet in spite of these defects *Paradise Lost* is a triumph of the poetic art, that all must admire and none can contemplate without awe. M.'s art derives its power from the fact that he kept the feeling for music which sustained the Elizabethan lyricists in their verse and that his ear was accustomed to the lute and madrigal singing. Not only was he the son of a musician, but composers like Henry Lawes (who set his *Comus* and *Arcades* to music) figure intimately in the idealistic life which, as a poet, he early shaped for himself. Great as were his epic achievements, the realisation of what reserves of song lay behind his lyric triumphs, leaves these supreme in their kind. His *Hymn on the Morning of Christ's Nativity* (1629) is a truly remarkable work for a youth of twenty. Its melody, 'based on vocal rhythms of high resilience, sustained with power throughout,' suggests a diemonic energy irresistibly bent on its own unfettered expression, and leaves us wondering what he could have accomplished in this sphere had he chosen it rather than that of the epic poet and political pamphleteer. It is indeed not a little curious that politics should have taken so strong a hold on a man who literally felt the needs of poetry grow upon him, and who, as a youth, had steeped himself in the reading of Spenser, Marlowe, Chapman, Shakespeare, Fletcher, Donne, and others, and who, on going to Cambridge, seemed to realise his own force in the utterance of noble harmonies. His

lyric testament, *At a Solemn Music* (1630), a bold experiment in dominant and cadent effects, suggests that the poet 'who had been writing sonnets, broke under the spur of music the sonnet form, and achieved a Pindaric triumph.' His power of experimentation in the lyric form was quickly developed after leaving Cambridge for Horton, for there his descriptive lyrics *L'Allegro* and *Il Penseroso* revealed a polish that makes previous examples of the art, e.g. in Ben Jonson, Lyly, and Fletcher, read like rudimentary improvisations. *Comus* and *Lycidas*, also written at Horton, touch the height of Eng. vers. in point of imagination, truth of idea, and great language combining to produce the utmost lyric harmony. When, within a few months of having written *Lycidas*, M. went to Italy, it was as one who was already deeply immersed in it. This preparation no doubt led his mind back to the sublime and comprehensive theme that was dear to him. It has been said that he originally designed this great theme to be Arthurian; but when he went to Italy it seems clear that he had begun to dream of an immortal work that should be founded on but rise far superior to an It. tragedy on the Fall of Man which had imprinted itself on his fancy. But in its ultimate expression his great theme was unquestionably shaped by his reactions to the Civil war which broke out at the time he returned to England. It is possible that war as an inspirer of poetic achievement did more for him than would any Arthurian medievalism; but that as it may, the result was to emphasise M. as the orator of his own passion, the great symbolist ranging over the whole field of nature, art, hist., and philosophy for the accents and allusions and images to carry his message.

His purpose, as was that of Aeschylus and other Gk. tragic poets, was to dispense with both the Gk. and the Heb. theogony, and to substitute a supernatural system acceptable to modern minds capable of 'that willing suspension of disbelief for the moment which constitutes poetic faith.' Yet *Paradise Lost* was little known in M.'s lifetime, and it was not until Addison wrote his well-known critique on it that its merits came to be understood. This is indicated by the meagre price M. received for it from Matthias Walker of St. Dunstan's; and the agreement between Walker and the poet is still preserved in the Brit. Museum. The total sum reckoned in modern values was about £250.

By his first wife M. had three daughters, two of whom used to read to him in various languages, though they are said to have understood only their own. His remains were interred at the par. church of St. Giles, Cripplegate, where a monument was erected to his memory, and there is another in Westminster Abbey. See the classic work by D. Masson, *Life of John Milton, narrated in connection with the Political, Ecclesiastical, and Literary History of his Time* (6 vols.), 1859-80. Masson also ed. M.'s works (2nd ed.), 1890. See lives and studies by M. Patti-

son, 1879; S. A. Brooke, 1879; R. Garnett, 1890; W. Raleigh, 1894; E. M. W. Tillyard, 1930; H. Belloc, 1935; and R. Warner, 1949; also R. Graves, *The Story of Marie Powell, Wife of Mr. Milton*, 1943; D. Saurat, *Milton, Man and Thinker*, 1944; and F. E. Hutchinson, *Milton and the English Mind*, 1949.

Milton. There are sev. places of this name in England: (1) M.-next-Sittingbourne (q.v.); (2) Small watering-place on Christchurch Bay, Hampshire, 6 m. from Lymington; (3) M. Abbas, a model vil. in Dorset, 7 m. from Blandford. There was formerly an abbey here, and the fine church still stands.

Milton: 1. Tn. of Norfolk co., Massachusetts, U.S.A., on the Nonposnet R., 7 m. S. of Boston. The U.S. Meteorological Bureau has an observatory and station on the Blue Hills near by. Fine granite is quarried, and there are manufs. of sealing-wax, paper, cement, and tallow. Pop. 18,700. 2. Bor. of Northumberland co., Pennsylvania, U.S.A., on the Susquehanna R. (W. branch), 52 m. N. of Harrisburg. Pop. 8300.

Miltonia, genus of epiphytal orchids, with large, flat, brilliantly coloured flowers resembling pansies in shape.

Milton-next-Sittingbourne mrkt. tn. and urb. dist. of Kent, on Milton Creek, an opening of the Swale, 10 m. E. of Chatham, on the S. Region railway. Paper is made here and the creek is noted for its oysters. Pop. 8000 (dist. 21,000).

Milward, Sir Clement Arthur (b. 1877), Eng. soldier, b. at Redditch, Warwickshire. He was educated at Rugby. In the First World War he took part in the campaigns in France and Mesopotamia. Between 1920 and 1931 he served in India, and was commander of the Lucknow dist. from 1934 until his retirement in 1938. Major-general, 1931. He was A.D.C. to the king from 1926 to 1931.

Milwaukee, chief city and port of M. co., Wisconsin, U.S.A., on the W. shore of Lake Michigan. It has a fine harbour, and carries on a large export trade in barley, wheat, and oats. The chief industries are agric. implements, including tractors; motor-vehicle bodies and parts; wholesale meat packing; electrical machinery; malt and malt liquors; steel-works and rolling-mills; cranes; dredging, excavating, and road-building machinery, and iron-castings; tanneries (curred and finished leather products); flour-mills; and manufs. of clothing machinery. The products of M. in 1939 were valued at \$754,000,000. The city has numerous fine public parks, a free hospital and sanatoria, a city hall, library, and museum, and sev. important educational institutions. Pop. 387,400. See J. S. Buck, *Pioneer History of Milwaukee*, 1876-1886; L. M. Larson, *Financial and Administrative History of Milwaukee*, 1908; and E. A. Fitzpatrick, *Wisconsin*, 1928.

Milyukov, Pavel Nikolaevich (1859-1943), Russian historian and politician b. near St. Petersburg. He taught hist. in the univ. of Moscow, 1886-95, was banished, and became prof. at Sofia, 1897-98, and member of faculty, Chicago

Univ., 1901-5. Returning to Russia in 1905, he was a member of the first Duma as a Constitutional Democrat. In 1917 he was foreign minister under Prince Lvov, and left Russia when the Bolsheviks obtained power. He settled in Paris after the peace (1919) and ed. a jour. (1921) advocating a patriotic Socialist alliance. Historical works include *Main Currents of Russian Historical Thought* (1893-95) and *Sketches of the History of Russian Culture* (1895-96).

Mimamsa (Sanskrit, investigation), two divs. of the orthodox Hindu philosophy, comprising a series of commentaries on the *Vedas*, the sacred books of India. The first div. is the *Purva-mimamsa* ('Prior Inquiry'), called also the *Karma-mimamsa* ('Investigation concerning Works'). The second is the *Uttara-mimamsa* ('Latter Inquiry') or *Brahma-mimamsa* ('Investigation as to the Supreme Spirit'). The principles of the M. are given in a series of *sutras*, or aphorisms, which are themselves so obscure as to need elaborate commentaries. The sage Jaimini is supposed to have been the founder of this kind of knowledge. The subject matter is the ritual given in the *Vedas*, on which it supplies a commentary. See R. K. Garbe, *Philosophy of Ancient India*, 1897.

Mime, in Rom. drama, was a vulgar presenntine of character or situation, compounded of song, dance, and dialogue. Ms. were popular during the new political era under Augustus, when the legitimate drama had ceased to exist except in small literary coteries. The best-known writers of M. were Decius Lauberius (105-43 B.C.) and Publius Syrus. Women played in them and cuckoldry was a stock theme. Gk. M. was originated by Sophron of Syracuse (c. 440 B.C.). See MIMOS.

Mimicry, evolutionary process by selection, which occurs both in animals and plants, giving them in the simplest way the equivalent of some advantage possessed by the object imitated. Sometimes the mimic assumes the appearance of a harmless creature so as to come within easy reach of its unsuspecting prey; an instance of this is the caracara, or curassow hawk, of Central America, which very closely resembles the gallinaceous curassow, and the hawk's victim, confusing them, allows it to approach within striking distance. More commonly M. is protective, and instances of this occur in many branches of the animal kingdom, such as the stick caterpillars, which assume a marvellously twig-like appearance on the shrub or tree where they feed: or stingless insects, which bear a sufficiently close resemblance to wasps and bees to be avoided by birds and other insectivorous enemies. A striking example of M. is the angler fish, which dangles small fleshy lumps at the end of long filaments over its large mouth. The small fish that nibble at the 'bait' fall an easy prey. M. occurs most frequently in plants, where the object is to attract insect pollinators. 'Müllerian M.' occurs when sev. species of animals (e.g. butterflies) all mimic one another and in this way reduce the mortality involved in the 'education'

of their predators. See also COLOURS OF ANIMALS. See G. D. H. Carpenter and E. B. Ford, *Mimicry*, 1933, and H. B. Cott, *Adaptive Coloration in Animals*, 1940.

Mimir, water-giant of Norse mythology, to whom belonged the fountain of wisdom beneath the world-ash Yggdrasil. This fountain was regarded as the source of memory and wisdom, and known as M.'s Well.

Mimnermus of Colophon, Gk. poet and contemporary of Solon, fl. in the latter half of the seventh century B.C. He is said to have invented the pentameter verse, to have brought the elegy back to its original design, the expression of personal grief. Fragments of his poems have been collected by Estienne, Brunck, Bölsomann, and Diehl. See C. Marx, *Dissertation de Mimnermo*, 1831.

Mimos, in Gk. drama, a development of the Doric farce. It was an 'imitation' of a single humorous scene or personality, and its most brilliant exponents were Sophron (fl. c. fifth century B.C.) and Herondas (c. 250 B.C.). He wrote in Doric prose, and dispensed with both chorus and plot.



MIMOSA PUDICA

A, the leaf closed after stimulation, B, the expanded leaf.

Mimosa, large genus of leguminous plants with feather-shaped leaves which in some species are sensitive to the touch, particularly *M. pudica* and *M. sensitiva*, both natives of Brazil, one bearing rose and the other purple flowers. The plant wrongly known as M. by florists is *Acacia*, a member of the same family, Mimoaceae.

Mimulus, or Monkey Flower, genus of fragrant annuals and perennials of the family Scrophulariaceæ. *M. moschatus* is the common musk. *M. cardinalis*, cardinal flower, is a popular garden plant bearing blooms which vary from scarlet to pale yellow. *M. cupreus* is orange and crimson. *M. glutinosus* is a valuable shrub which bears orange or scarlet flowers almost all the year round. *M. guttatus* is a N.W. Amer. plant, now naturalised in Britain; it has showy yellow flowers and is common by the sides of streams.

Min, Egyptian deity, god of fields and highways, later identified with Amon. The oldest Egyptian statuary is the three colossi of M. in limestone, discovered at Coptos in 1894 by Petrie.

Min, riv. of China in the prov. of Fukien. It discharges into the sea 30 mi. below Fuchou-Fu. Length 375 m.

Mina (Heb. *mānēh*, weight, from *mānāh*, to divide): 1. Gk. weight, containing 100

drachme, or close upon 16 oz. 2. Sum of money equal to the sixtieth part of a talent. The coin was never minted, but only employed for purposes of account. The value of the Attic M. was £4 1s. 3d., that of the Æginaean M. £5 1s. 7d.

Minab, or Minau, tn. of Persia, in the prov. of Kerman, 52 m. S.E. of Bender Abbas, in an oasis noted for dates. Pop. 10,000.

Minæan Inscriptions. The importance of the M. I., numbering sev. hundreds, can be gauged when we consider that practically all we know of Minæan hist. is based upon them. The M. I., as well as the other S. Arabian inscriptions, especially Sabæan, are indeed our main source for the study of the once flourishing kingdoms facing on the Red Sea and the Indian Ocean, whose splendour has been immortalised by the biblical account of Solomon and the queen of Sheba. The biblical table of nations (Gen. x. 26-29) contains in genealogical form a record of peoples of S. Arabia, but the names of the Minæans and of some other famous peoples mentioned in the inscriptions are lacking, from which it may be concluded that they did not rise to prominence till a later date. It must, however, be pointed out that the Minæans are not even mentioned in the numerous Sabæan inscriptions, which partly at least were contemporary. Scholars have tried to explain this curious omission by the fact that very few Sabæan inscriptions are historical in content. The earliest Gk. account of the Minæans (*Maiaioi* or *Miyaoi*: Ma'in of the inscriptions) is given by Eratosthenes (276-194 B.C.) in Strabo, xv. 4, 2: the Minæan kingdom was situated on the Red Sea; its cap. was Carna; there was an important trade in frankincense, myrrh, and other spices, and the merchants made the journey from Elana (in Heb., Elath, near modern Akabah) to Minæa in seventy days. The Rom. Emperor Augustus entrusted Aelius Gallus with an expedition to S. Arabia (Strabo, xvi. 4, 22). The expedition brought back a considerable knowledge of the country, and Pliny the Elder's account of this region (*Historia Naturalis*, xii.) is partly based on the results of this expedition and partly on the itineraries of travellers to India. Even more important is the *Peripus Maris Erythriæ*, written by an anonymous contemporary of Pliny probably in A.D. 77.

Doubts as to the great importance of ant. S. Arabia, as attested by the Bible and by the vague references in classical writers, persisted not only until Carsten Niebuhr's (a Dan. scholar) expedition in 1761-69, which marked the beginning of S. Arabian exploration, but even far into the nineteenth century. In 1869 J. Halévy carried out the first exploration of the rock-cut inscriptions, and brought back nearly 700 inscriptions from this region. E. Glaser (1855-1908) and other scholars increased the number of the S. Arabian inscriptions by sev. thousands. Some twenty-seven kings are known from the Minæan inscriptions, and twenty of them are known to be related to one another. Their hist. must thus cover sev.

centuries. The Minean kings were independent of the Sabaeans and were their rivals in the trade with the neighbouring countries as well as with regard to the hegemony of parts of Hadramaut. Various inscriptions couched in Minean were found in the dist. of the important oasis al-'Ula, in N. Arabia. It is therefore assumed that the Mineans had colonies in that region.

The relative age of the Minean and the other S. Arabian inscriptions is a matter of dispute among scholars. Until recently the Minean kingdom was considered as the oldest: E. Glaser placed its beginnings in the second or even the third millennium B.C.; F. Hommel dated the Minean kingdom between 1300-1200 and 700 B.C.; D. H. Müller thought that none of the M. i. is earlier than about 800 B.C. According to the recent theory of the Canadian scholar F. V. Winnett (1939), the beginnings of the Minean kingdom should not be dated beyond 500 B.C.; it flourished in the Hellenistic period, and its collapse occurred somewhere between 21 B.C. and A.D. 50. The M. i. are written in a variety of the S. Semitic script (*see under ALPHABET*).

Minaret. Eng. form of the Arabic *manārah* from *nāra*, lighthouse. It is the name of the storied turret, which embellishes Mohammedan mosques and from the balcony of which the muezzins chant the 'azan,' to summon believers to prayer.

Minas, tn. of Uruguay, cap. of the dept. of Lavalleja and 80 m. by rail from Montevideo. One of the most picturesque tns. in the country. There are quarries and mines in the neighbourhood. Pop. 30,000.

Minas de Rio Tinto, *see* RIO TINTO.

Minas Gerais (general mines), inland state of Brazil, N. of Rio de Janeiro, with an area of 221,894 sq. m. The surface is for the most part mountainous, with well-watered plateaus. The climate is extreme, and for the most part unhealthy. Sugar-cane, tobacco, rice, and cereals are extensively cultivated; coffee is grown, and there is great modern agric. development. As regards mineral wealth, M. G. ranks among the first of the Brazilian states. Gold, silver, copper, manganese, platinum, diamonds, rubies, and other precious stones are found; extensive iron works have been erected, and aluminium has been produced since 1945. Cotton and wool-weaving, and the making of cigarettes, are important industries. Cap. Belo Horizonte. Pop. 7,556,800.

Minatitlan, tn. of the state of Vera Cruz, Mexico, 19 m. from Puerto Mexico. It has one of the largest petroleum refineries in Mexico. Connected by rail with Puerto Mexico (Coatzacoalcos), Carmen, and Vera Cruz. Its main products are coffee, cereals, timber, rice, sugar, and petroleum.

Minbu, tn. of Burma and the cap. of the dist. of Minbu, on the r. b. of the Irrawaddy. Rice, grain, millet, beans, peas, and tobacco are grown. Pop. of dist. 302,400; of tn. 6700.

Minch, or Minsh (stormy sea), arm of the Atlantic Ocean which separates the

N.W. mainland of Scotland from the is. of Lewis, belonging to the Hebrides. It is from 20 to 46 m. in width, and about 60 m. from N.N.E. to S.S.W., and has a rapid current. A portion of it, called the Little M., is a passage separating the is. of Skye, in the Inner Hebrides, from the middle part of the outer Hebrides. S. Harris, N. Uist, and Benbecula. This is from 14 m. to 20 m. in width.

Minchinhampton, tu. of Gloucestershire, England, 4 m. S.E. of Stroud. M. Common is a noted beauty spot of the Cotswolds. There are breweries and a woollen mill. Pop. 1500.

Mincio (anc. *Mincius*), riv. of Italy, which rises in Lake Garda. It flows S. and S.E. through Mantua, and enters the R. Po about 10 m. S.E. of Mantua. Length 120 m.

Mind, seat of consciousness, thought, volition, and feeling; soul (q.v.) as opposed to body. St. Thomas Aquinas defines M. (*mens*, from *mensurare*, to measure) as those faculties of the soul which in their operation dispense entirely with matter. Primitive man is not conscious of a material body and an immaterial M., but rather an acting, feeling, and thinking body—the unity of himself, or of the material conscious self; and if such phenomena as dreams and ghost-seeing may have made him conceive the possibility of a separation of himself from his earthly body, yet this conception never took the form of anything we should call immaterial.

The inner self, the soul or ghost, remains with him, still only a more tenuous body. Gk. philosophers were not preoccupied with the question of M. and matter; their chief problem was the question rather of idea and matter, or the conceptual world as separated off from the world of the senses. To behold the idea, said Plato, man must get rid, so far as he can, of eyes and ears, and the whole body, and rely solely upon the pure light of the M.; for to the body are due only our aberrations and failures to see the truth. The problem of the relation of M. and body only becomes an insolent one from the time of Descartes. The basis on which Descartes builds is the undeniability of consciousness, from which he proceeds to establish the existence of God and of the world and, through the medium of the principle of causality, assumes that he has bridged the gulf between himself and external reality. The main point about which this development centres is the sharp distinction which Descartes draws between M. and matter—the two substances into which the world of experience is divided. With him M. is a thing which thinks and 'however we may regard the adequacy of this term to express the essential character of the soul, at least it emphasises the entirely immaterial nature of consciousness, and makes it possible for exact thinking to avoid that confusion of the conscious life with the outer world, which lies at the bottom of the obscure hylo-Zoism of earlier philosophers, and the conscious materialism of more modern times' (A. K. Rogers, *History of*

Philosophy, 1901). If M. and matter are so absolutely and totally different in their nature, how can they come together to form a single world, or react upon and affect each other, as apparently they do? In his *Tract on Man* Descartes undertakes to show how, assuming the body to be nothing but a machine of clay, the mere mechanical motion of parts is enough to account for what we call life; but 'clearly when the reasonable soul shall be in this machine, it will have its principal seat in the brain.' But Descartes was not prepared to carry out his conception to the final consequences, for that would have been to deny altogether the influence of the will, i.e. of ourselves, upon our actions. Accordingly he admits that while our more habitual and reflex actions are due to mechanism alone, yet it also is possible for the M. to interfere and alter the motions of the body. The seat of this interaction he supposed to be a part of the brain known as the pineal gland; but how this conjecture could conceivably be tested he did not explain. In short, he admitted the fact of a mutual influence between the soul and the body, but did not attempt to explain its possibility. Whence the doctrine of Occasionalism (see GEULINX; MALEBRANCHE), which admitted the difficulty of an interaction but 'solves' it by falling back on the omnipotence of God: i.e. it is no power of the human M. that effects an alteration in the physical world, but a direct act of God.

Descartes had seen that strictly there is only a single substance: matter and M. are not conceivable in themselves, but can only be understood by reference to God; and Spinoza therefore is entirely consistent in reducing them from substances to mere attributes of the one substance, God (see SUBSTANCE). Spinoza's doctrine of substance leads the way to a different solution of the problem of the Cartesians concerning the relation of M. and body or, in other words, the problem of explaining how one substance can act upon another of a wholly different nature and how to avoid the apparent automatism which man seems to share with brutes and even inanimate things—difficulties not really obviated by Occasionalism. According to Spinoza, if the attributes of thought and extension (the only two known attributes of an infinite number belonging to the nature of God) are not two separate things, but only aspects of one and the same thing, they cannot interfere or interact on each other. But as they are both attributes of the same substance, that which in one light appears as a mode of extension or physical fact will be, in another light, a mode of thought or fact of consciousness; and therefore the two modes will correspond. In this way Spinoza purports to justify the claims of science to explain all physical events, including the movements of the body, in purely physical terms. Leibniz put forward a reconstruction of the idea of substance, both mental and material. Descartes had defined matter as extended substance, passive, inert, and able to receive motion only from outside. Leib-

niz substituted power of resistance for extension as the essential quality of matter, and from that new standpoint there was opened up the possibility of removing the absoluteness of that distinction between matter and M. upon which Descartes was so insistent. With Leibniz reality is made up of an infinite host of individual beings, or monads (see MONAD AND MONADISM), representing an infinite number of different grades of development, and what we call a body is, for him, not an actual material thing, but a group of monads of the less developed sort; and every soul or higher monad has such a group of inferior associates with which it stands in a specially close connection. In this way Leibniz attempts to establish a real unity in the world.

In the nineteenth century the scientific doctrine, or law of the conservation of energy (see under ENERGY), gave a new unity to the mechanical interpretation of the universe, together with a new emphasis to the feeling, on the part of scientists, that it is impossible to make consciousness serve in any sense as an explanation of bodily acts. In the result, therefore, there has been a widespread disposition to accept the old Cartesian doctrine of the automatism of the physical body, and to regard the psychical processes as simply running alongside the physical movements, without exerting any influence upon them (the doctrine of psycho-physical parallelism). Modern science, however, is recognising increasingly the importance of the mental factor both in health and disease (see PSYCHOLOGY; PSYCHIATRY), and from the opposite approach it is significant that such concepts as 'the free-will of the atom' have been introduced into the latest theories of matter.

For centuries different schools of philosophy have sought to resolve the old and most fundamental problem of the relation between M. and matter. Some have sought to show that M. is nothing more than an emanation in the course of evolution from matter; others that matter is nothing more than a concept of the M., which alone is real. These efforts have been unsuccessful, and neither view has won general assent. The former, or materialists, seem to ignore the obvious lessons of daily experience, for we see, every moment, events which cannot be accounted for by derivations, however subtle, from physical or chemical processes. The latter, or idealists, on the other hand, 'do not explain the fact, which we must accept from astronomy, geology, and anthropology, that the stars and planets and this earth existed eons before man existed and cannot therefore be a product of human thought' (Viscount Samuel). If it is said that matter may still be an emanation of M.—the M. of God—that is merely an evasion in the manner of Occasionalism. The whole effort to resolve M. into matter or vice versa is the outcome of 'the philosophic craving for unity' (T. H. Green). But some deny the need for any such unification and offer the alternative of an essential duality in

nature. Scientists have estab. that the acceptance of sense stimuli, the transmission of their effects along the nerve fibres, and their activation of different parts of the brain, are mechanical; and whether the approach is from bio-physics or biochemistry, anatomy or pathology, the conclusion is the same - these are material activities, obeying mechanical laws. But no more than the physiologist is the anatomist able even to suggest how the physico-chemical phenomena associated with the passage of nervous impulses from one part of the brain to another can be translated into a mental experience (Prof. Le Gros Clark). Aristotle, 2000 years ago, was asking how is the M. attached to the body? Mankind is still asking that question.

For bibliography see works mentioned in the articles PHILOSOPHY; PSYCHOLOGY.

Mindanao, second largest and most southerly of the Philippine Is., covering an area of 36,537 sq. m. Three or four ridges cross the is., with intermediate depressions and many rvs. and lakes. It has the volcanoes of Apo (10,312 ft.), Macaturing, and Sanggul in the N., and in the S.W. stretches a long, narrow peninsula continuing in the Basilan Is. and Sulu group. The prin. bays are Butuan on the N., Davao on the S.E., Savangani, Sibuley, and Illana on the S. The chief rvs. are the Rio Grande de M., rising in the N. and flowing into Illana Bay, and navigable for 70 m. from its mouth, and the Butuan. The interior of the is. is wild, and covered for the most part with unexplored forests. The raising of cattle and horses is the chief industry; timber, gold, and petroleum are produced. Pop. 2,943,300.

In the Second World War Jap. forces landed on M. at Davao (Dec. 20, 1941) and heavy fighting ensued with Amer.-Filipino forces. Resistance, however, was overwhelmed by vastly superior forces and the is. fell in April 1942. M. remained in Jap. hands for more than three years. Amer. forces landed on May 11, 1945, and on the 13th captured the largest aerodrome and the rest of the is. See PHILIPPINE ISLANDS.

Minden, tn. in Westphalia, Germany, on the l. b. of the Weser, about 38 m. W.S.W. of Hanover by rail. There is a fine Catholic cathedral, dating from the eleventh and thirteenth centuries, which suffered severe damage in the Second World War. The manufs. are linen and woollen goods, chemicals and glassware. In 1759 a victory was gained here by the Hanoverian, Brit., and Brunswick forces over the Fr. Pop. 27,000.

Mindererus Spirit, known in the *Pharmacopœia* as *Liquor ammonii acetatis*, the dose being 2 to 6 fluid drachms, is a solution of ammonium acetate, prepared by neutralising ammonium carbonate with acetic acid. It is used as a diaphoretic in febrile diseases, as an eyewash, and also on hot flannels in the case of mumps.

Mindoro, one of the Philippine Is., lying S. of Luzon, 110 m. long, 56 m. broad, and covering an area of 3759 sq. m. The highest point of the is. is Mt. Halcon

(8868 ft.). Calapan, in the N.E., is the cap. Rice, cocoa, tobacco, hemp, cotton, etc., are raised, and various kinds of timber are exported and coal and sulphur are worked. It was captured by the Japs. early in 1942, and occupied until Dec. 1944. Pop. 167,700.

Mindszenty, Cardinal Joseph (b. 1892), primate of Hungary, the son of a peasant couple named Pehm. During the Second World War, while still a par. priest, he changed his name to M. after the vil. Csehimindszent where he was born. He openly defied the Nazis and was imprisoned by the Gers. until his release by the Red Army. He was made cardinal in 1945 and his popularity soon made him a powerful force in Hungary. The advent of a Communist régime brought him into conflict with the State. He refused to compromise on Christian principles, especially in regard to education, or to leave the country, and in 1948 was arrested on charges of offences against the State, having previously warned his people against any confessions that might be extracted from him. His trial was a travesty of justice and he was sentenced to life imprisonment. See also HUNGARY.

Mine Gases, see under COAL-MINING.

Minehead, mrtk. tn. and watering-place of Somerset, England, 24 m. N.W. of Dunster and 25 m. from Taunton, on the W. Region Railway. It is a hunting centre. There is a small harbour and North Hill overlooks the tn. From here tourists can reach Exmoor. Pop. 7000.

Mineo (anc. Menæ), tn. of Sicily in the prov. of Catania, 27 m. S.W. by W. therfrom. Pop. 10,000.

Mineral Dressing, purification of ores, coal, oil, etc. See also MINERALS.

Mineral Kingdom, one of the three great depts. into which nature has been divided, viz. animal, vegetable, and mineral. Members of the animal and vegetable kingdoms are characterised by the development of special organs or structures adapted for 'life' or 'growth.' The M. K., however, is concerned only with minerals which may be described as natural homogeneous substances, formed under conditions in which neither animal nor vegetable life has taken part. Minerals increase by a process of accretion, not by assimilation, as in the organic kingdoms, and are also bounded, in their most developed form, by plane surface, i.e. are crystallised.

Mineralogy. Treatises on M. by Theophrastus, Dioscorides, and Pliny, although now of little scientific value, show that the study is of great antiquity. Agricola in the sixteenth century, in his work, typifies the advance made in descriptive M.; Wallerius in 1747 issued the first systematic descriptive work, and Romé de Lisle in his *Crystallographic* (1772) first applied to the science the principles of crystallography. Later mineralogists, Werner, Haüy, von Kobell, and others of the present day, have brought the science to its present exactness. M. is concerned with the chemical and physical characters of minerals (which embrace crystallography), and on the geological side discusses their modes of occurrence,

whether original or secondary, and their modes of origin, whether aqueous, igneous, or organic. With regard to the chemical composition of the minerals, qualitative and quantitative analyses can be performed. Complete analysis in the wet way is necessary to determine a formula for the mineral. The complete study of a mineral involves a knowledge of many factors. The crystalline form is of paramount importance, and it is usually an easy matter to discover the particular crystal system to which a mineral belongs, and also in a majority of cases to find what crystal class is represented. The methods of doing this are essentially those involving the principles of crystallography (*q.v.*). Closely connected with this might be mentioned cleavage, or the facility of a crystal for breaking regularly along well-defined planes, which sometimes give indications of the symmetry underlying the building plan. Etch figures, caused by the action of various agencies, and surface markings are not infrequently of great assistance in finally determining the crystal class of a mineral. Thus iron pyrites is found in cubes, but striations on adjacent faces are so disposed that the full amount of cubic symmetry is impossible, in spite of the fact that the cubes are otherwise perfect. Twinning, or the conjunction of more than one individual according to a definite plan (*e.g.* in macles of diamond), is an important characteristic of some minerals. A number of purely physical characteristics are of the utmost use to the mineralogist, including hardness, elasticity, cohesion, pyroelectric effects, specific gravity, specific heat, structure, colour, tenacity, lustre, fusibility, electric and magnetic properties. It must be remembered that minerals do not by any means show perfect crystalline form. Some of them appear in crystalline conglomerations with no particular attempt at the presentation of even one or two perfect units, whilst many minerals are not even crystalline at all. A rich line of investigation for crystalline specimens in particular is that which makes use of the many optical properties of matter. Much information can be obtained by an examination of the effect of light on such specimens. Thus all cubic crystals are said to be optically isotropic, *i.e.* they behave like glass in presenting identical optical effects in all directions. For such crystals there is only one refractive index (*e.g.* with fluorspar). If the crystal belongs to either the tetragonal or the hexagonal system, there is one direction in the crystal, along the unique or optic axis (tetragonal in one case, hexagonal in the other) where the passage of light is perfectly normal, and one refractive index corresponds to it. In other directions there are two refractive indices to consider, corresponding to the splitting up of the light in two directions in the crystal. Crystals belonging to these two systems are said to be uniaxial. The double refraction is due to the presence of two plane-polarised rays whenever light passes through the crystal (except along the optic axis). The rhomboic, monoclinic,

and anorthic crystals, which are often met, are biaxial, and there are three refractive indices to take into account. Again crystals can be examined in polarised light, when further information is afforded as to pleochroism and interference figures (*q.v.*). The minerals present in the most close-grained rocks can be determined upon examination of thin sections for the microscopic. (See PETROLOGY.) In recent years rapid advances have been made in the determination of the internal structure of the units composing the mineral crystals. It is possible to gain a very good idea of the plan underlying the building up of crystals by means of X-ray diffraction methods (*q.v.*), whereby not only the nature of the building groups can be found, but also their relative positions in the crystal. Other advances have been made, particularly in the study of radioactive properties of some minerals, and in the characteristic colour effects produced by ultra-violet light when allowed to impinge on many crystalline specimens. This effect alone often suffices to show up the presence of a particular mineral in a specimen. Still more recently the electron microscope (*q.v.*) has been usefully employed in mineral analysis or identification.

Minerals may be classified as metallic and non-metallic, but generally are classified into groups, the members of which show a certain unity chemically, physically, and crystallographically. A usual classification is to divide minerals into main groups based on chemical similarity and then to subdivide these again.

1. Native elements—including metals and non-metals, *e.g.* gold, silver, copper, sulphur, etc.

2. Halides—*including* fluorides (fluor-spar, CaF_2), chlorides (salt, NaCl), more complicated bodies like cryolite ($3\text{NaF}, \text{AlF}_3$).

3. Sulphides—galena (PbS), blonde (ZnS), greenockite, cinnabar (HgS), pyrites (FeS_2), marcasite (FeS_2).

4. Oxides—copperite (Cu_2O), cassiterite (SnO_2), corundum (Al_2O_3), rock crystal (SiO_2).

5. Sulpharsenites, etc.—tetrahedrite ($3(\text{Cu}_2\text{S} \cdot \text{Sb}_2\text{S}_3)$; tennantite ($3\text{Cu}_2\text{S} \cdot \text{As}_2\text{S}_3$); pyrargyrite ($3\text{Ag}_2\text{S} \cdot \text{Sb}_2\text{S}_3$); proustite ($3\text{Ag}_2\text{S} \cdot \text{As}_2\text{S}_3$).

6. Carbonates—the calcite class, *e.g.* calcite (CaCO_3), rhombohedral. The aragonite class, rhombic.

7. The sulphates—the rhombic sulphates, *e.g.* barytes (BaSO_4). Others such as gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$).

8. The aluminates—spinel, MgAl_2O_4 .

9. Borates—borax ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$).

10. Phosphates—apatite ($\text{Ca}_5\text{F}(\text{PO}_4)_3$).

11. The tungstates and molybdates.

12. Niobates and tantalates.

13. The uranates.

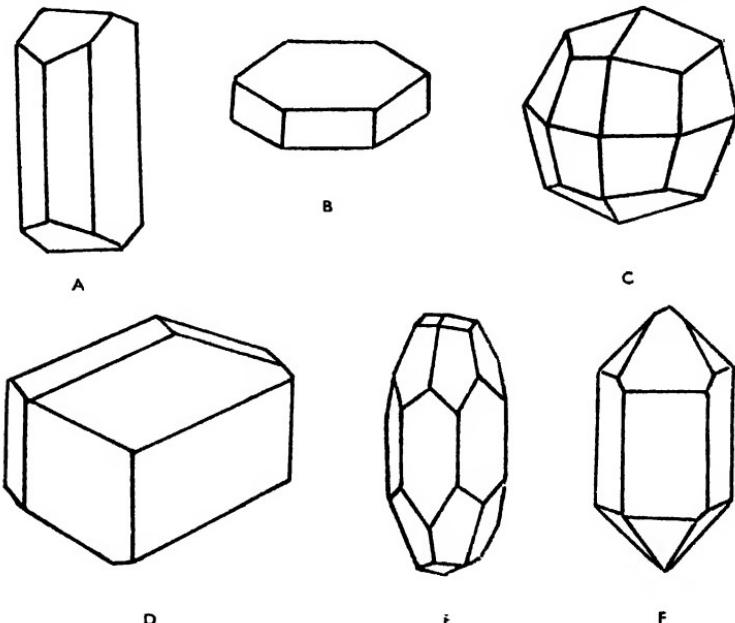
14. The silicates—perhaps the most important group of all. This includes amphiboles (hornblende); pyroxenes (augite, monoclinic; enstatite, rhombic); the felspar group (orthoclase, anorthite); mica; topaz; tourmaline; the zeolites; the garnets; and many others.

Minerals of analogous constitution often have the same crystalline form. This

isomorphism is well shown by the carbonates; calcite (CaCO_3); magnesite (MgCO_3); calamine (ZnCO_3); chalybite (FeCO_3); rhodochrosite (MnCO_3), which are similar in form, occurring in rhombohedral crystals, and show the same cleavage and optical properties. Substances having the same chemical composition may crystallise in two forms, i.e.

are so related that one is the mirror-image of the other. Many minerals, when found in good specimens, are utilised for the fashioning of gem stones. Amongst these a few may be quoted: diamond, ruby, sapphire, spinel, beryl and emerald, zircon, sphene, garnet, etc.

To the class of silicates belong the majority of rock-forming minerals, which



CRYSTALS OF SOME TYPICAL MINERALS

A. Orthoclase felspar (monoclinic). Crystals common. Prismatic, made up of pinacoid, prism, and basal faces. Twinning very common on three laws: (1) Carlsbad, (2) Mönch, and (3) Baveno.

B. Mica (monoclinic). Usually in six-sided tabular crystals.

C. Garnet (cubic). Rhombohedra or trapezohedra, or a combinations of these forms.

D. Hornblende (monoclinic). Crystals common. Prismatic, combination of clinopinacoid, prism, clinodome, and hemimorphodome.

E. Calcite (hexagonal, rhombohedral, calcite type). Three main types: (1) dog-tooth type, combination of prism and scalenohedron, (2) nail-head type, combination of prism and flat rhombohedron, and (3) prismatic crystals.

F. Quartz (hexagonal). Hexagonal prism bounded above and below by hexagonal pyramids.

they are dimorphous. Thus the carbonate of calcium occurs in the rhombohedral system as calcite and in the rhombic system as aragonite. The silicates, which form the largest class of all minerals, exhibit fully those phenomena of isomorphism, dimorphism, and polymorphism. Titanium dioxide is found in the forms rutile and anatase (which are both tetragonal, but differ in characteristic angles) and brookite, which is rhombic. A few minerals show the phenomenon of enantiomorphism, owing to peculiar structure of the particles building up the whole. Thus right- and left-handed quartz

are classified into families or groups, such as the amphiboles, pyroxenes, felspars, micas, zeolites, etc., according to their similarity of chemical composition and crystalline properties. In their modes of occurrence minerals are essential or accessory, according as their absence would either alter the rock and make it fundamentally different or would not affect its petrographical species. Thus quartz is an essential constituent of granite, its removal altering the petrographic species to syenite. All essential minerals are original, but the converse is not true. Thus topaz and sphene may be original

constituents of granite, but are yet accessory minerals in that their absence does not alter the rock fundamentally. Accessory minerals frequently occur in cavities where they had room to crystallise out from the general mass, as, for example, the crystals which line the 'drusy' cavities in granite. Secondary minerals, the result of subsequent changes in rocks, are generally due to the chemical action of percolating waters and gases, either from above (as in the formation of kaolin) or from below (as in the formation of gneiss and tourmaline). Groups of minerals are found associated, indicating a significant paragenesis. It is observable that basic minerals tend to separate out together from rock magmas by the process of magmatic differentiation. In saline deposits calcite, gypsum, rock salt, carnallite, etc., are frequently found associated. The decomposition of minerals by the action of percolating waters frequently gives rise to pseudomorphs, i.e. the external form of a mineral is retained while being replaced by other minerals. Thus calcite organisms may become silicified, due to the interchange of silica for calcite, thus giving pseudomorphs of silica after calcite. As well as occurring in the crystalline form minerals assume a concretionary form, some being particularly prone to assume this form. Siderite is generally nodular, while calcite is often found in concretionary form. Silica often assumes this shape, as in the botryoidal form of chalcedony. Several hundred species of minerals have been described, and the number is constantly increasing by the addition of new ones. See also CLEAVAGE; CRYSTALLOGRAPHY; ISOMORPHISM; PETROLOGY. For text-books see E. S. Dana, *System of Mineralogy*, 1837 (ed. C. Palache, H. Berman, and C. Frondel), 1944, and *Text-book of Mineralogy*, 1926; F. A. A. Lacroix, *Les Encyclopédies des roches volcaniques*, 1893, and other works on the M. of France and Fr. colonies; J. P. Iddings, *Rock Minerals*, 1911; A. de Laparent, *Précis de minéralogie*, 1921; A. E. Tutton, *Crystalllography*, 1924; H. A. Miers, *Mineralogy*, 1929; H. Louis, *Mineral Deposits*, 1931; W. R. Jones and D. Williams, *Minerals and Mineral Deposits*, 1948; H. H. Read, *Huxley's Elements of Mineralogy*, 1948; and Chambers's *Mineralogical Dictionary*, 1948.

Mineral Oil, see PETROLEUM.

Mineral Phosphates, mineral deposits containing phosphoric acid in combination. Some occur in coprolites as calcium phosphate. These are stony deposits found in conjunction with Jurassic rocks. They represent the fossilised excrements of animals. Other M. P. are apatite, $\text{Ca}_5(\text{CaF})(\text{PO}_4)_3$; wavellite, $2(\text{ACO})_3(\text{PO}_4)_2 \cdot 9\text{H}_2\text{O}$; turquoise, $\text{Al}_2(\text{OH})_6\text{PO}_4 \cdot \text{H}_2\text{O}$; monazite, $(\text{Ce}, \text{La}, \text{Dy})\text{PO}_4$, and pyromorphite, $\text{Pb}_5(\text{Cl})_3(\text{PO}_4)_3$. The most important deposits of M. P. occur in N. Africa and Florida. See PHOSPHATES.

Mineral Rights, Taxation of, see LAND TAXES.

Mineral Waters, so called owing to the presence in them of mineral constituents derived from the rocks over which they

flow. The waters are sometimes cold, or may be warm or even boiling. As a general rule the thermal waters are more mineral than cold waters, although there is no relation between the temp. and the chemical composition. M. W. may be classified according to the prevailing mineral substance contained in them. Earthy M. W. generally contain carbonate or sulphate of calcium, and occur abundantly in limestone dists. Such are the hot springs of Bath. The waters of Baden and Conrexéville are also of this type, the waters generally being sulphured. Feruginous or chalybeate waters contain a large proportion of ferrous carbonate, and are known by their 'inky' taste. Brine springs contain sodium chloride or salt. The brines worked as sources of salt are derived from borings into saliferous beds; such are the springs of Cheshire, Salzkammergut (Austria), and Box (Switzerland). These springs also contain chlorides of potassium, magnesium, and calcium, sulphates of calcium and other metals, silica, phosphates, nitrates, and gases such as carbon dioxide, sulphuretted hydrogen, etc. The hot springs of volcanic dists. usually contain dissolved mineral matter, chiefly silica, with sulphates, carbonates, chlorides, etc. The oil springs of America are typical mineral springs. Medicinal springs are M. W. which are believed to have a curative effect on diseases. These medicinal waters may be (1) Alkaline, containing lime or soda and carbonic acid, as at Vichy and Saratoga. Some alkaline M. W. contain lithium carbonate (e.g. at Bilin and Carlsbad). (2) Bitter waters with sulphates of magnesia and soda, as at Seidlitz and Kissingen and Epsom. These waters have aperient properties. (3) Salt, as at Wiesbaden, Cheltenham, Droitwich, and Homburg. (4) Earthy, as at Bath and Lucca. (5) Sulphurous, containing sulphur in the form of sulphides and sulphuretted hydrogen, as at Aachen, Harrogate, and Aix-les-Bains. (6) Special varieties. Thus arsenical waters are found in the S. Tyrol and in France, whilst barium-containing M. W. are represented in some places (e.g. Harrogate). The waters of these springs may be warm and acquire their medicinal reputation from their thermal qualities. In sulphurous waters the sulphuretted hydrogen and sulphurous acid are sometimes oxidised into sulphuric acid which remains free in the water. Waters containing carbon dioxide are used as table waters, e.g. Apollinaris. Helium is occasionally found in M. W., and also disintegration products from radium. It has been averred that the medicinal qualities of some of these 'cure waters' are due to the presence of radium in small quantities. 'Gouty' and rheumatic ailments are most likely to benefit by M. W. Dyspepsia and kindred stomachic troubles benefit by the diet and general health regime, as well as by the waters. Skin diseases are best cured with sulphurous waters; anaemia improved with iron waters and purgatives, while hydro-therapeutic treatment benefits the obese and diabetics. (See also BALNEOLOGY; BALNEOTHERAPEUTICS; HYDROTHERAPY).

Artificial Mineral Waters have been manufactured for many years; they were first prepared by the Rev. Joseph Priestley (q.v.). Originally attempts were made to copy exactly the composition of the natural M. W., but in recent years the tendency has been to incorporate substances of medicinal or palatable value which are not necessarily found in natural waters. In most artificial M. W. carbon dioxide is forced into the liquid under pressure.

Miner's Anæmia, *see ANKYLOSTOMIASIS*.

Miners' Federation of Great Britain, formerly the federation of coal miners' trade unions of Great Britain. It was estab. in 1888, when its membership was 36,000. Its political power received an impetus from Fr. ideas before the First World War, though the leaders of the great coal strike of 1912 were not syndicalist. Before the First World War their programme was nationalisation and state administration of the mines, but after the First World War it was changed to a demand for national ownership coupled with democratic control by the workers. This programme of guild socialism was in fact presented before the Sankey Commission of 1919. In 1944 the unions affiliated with the M. F. of G. B. were amalgamated into the National Union of Mineworkers. See R. Page Arnot, *The Miners. A History of the Miners' Federation of Great Britain, 1889-1910*, 1949.

Minersville, coal-mining bor. of Pennsylvania U.S.A. Pop. 8600.

Minerva, Rom. goddess, identified with the Gk. Athena. Her worship was celebrated with that of Jupiter and Juno in the temple on the Capitol. Her festival, called *quinquatrus*, fell on March 19, and lasted five days. She was the goddess of wisdom and good counsel. A carved image of her, called the 'Palladium', and supposed to have been carried from Troy by Aeneas, was preserved in the temple of Vesta. See A. Warde Fowler, *Roman Festivals*, 1908.

Mines, Military and Naval. Military mining belongs to the oldest application of engineering to the art of war. At least four centuries before the Christian era such warfare was known. Long before gunpowder was used places were captured by gaining access through mine galleries. Gunpowder was first used in mine-warfare in 1487, after which mining became more common. At the siege of Sebastopol over 5 m. of galleries were driven by the opposing armies. The First World War produced conditions similar to those of siege warfare, and special troops had to be trained for this. The Ger. were the first to use mines in Flanders in Dec. 1914. The great mining feat of the First World War was the blowing up of the Messines Ridge on June 7, 1917, by the Brit., who used 1,000,000 lb. of explosives on a 10-m. front. The effect of this attack was to put a stop to Ger. aggressive mining. With the improvements in the range and weight of field artillery and in bombing aircraft, the need for underground protection in future wars brought into being methods of mining to cope with these improvements.

In the Second World War, partly owing to its less static character, offensive mining of the classical type became virtually obsolete. The Ger. produced two models of remote-controlled tank, loaded with explosive and detonated by radio; these were intended to destroy enemy field-works, and were used against the Anzio bridge-head, without much success, in the role of the old siege-mine. Defensive mining, on the other hand, increased in importance. In the W. desert, owing to the general absence of natural obstacles, minefields became the prin. feature of defensive positions, such as the perimeter of Tobruk and the Tel-el-Iessa-Qatara line. The mines used were of two types, anti-tank and anti-personnel. The former depended for their effect on blast alone, and required generally speaking a larger explosive charge (usually amatol) to break the tracks or damage the suspension of the tank. The Ger. *Tellermine* can be taken as the type of anti-tank mine as developed up to 1945. Anti-personnel M. can be either blast or fragmentation. Both were detonated by pressure on the cover, like the anti-tank M., or by means of a trip-wire. Fragmentation M. caused damage either by the simple splintering of a metal container similar to the projectile casing of an H.E. shell, or by a shrapnel effect, as in the Ger. *S-mine*. This was in effect a short mortar buried upright in the ground with a very weak propelling charge. When detonated it projected a container into the air about the height of a man's waist; it then burst, scattering laterally a quantity of shrapnel bullets. The development of mine-detectors, which depended for their efficacy on 'echoes' rebounding from metal objects, caused a revolution in the design of land-M. These now tended more to rely on blast effect as the charge had to be housed in a non-metallic container such as wood, plastic, or even papier-mâché (*Pappmine*). Non-metallic fragmentation M. were, however, made with glass and pottery casings.

Naval M. were first used during the Amer. civil war; some were controlled from the shore by electrical means, while others were operated automatically. During the Russo-Jap. war an improved mine was used which could be arranged to take any depth of water between 30 and 70 fathoms. This was a 'non-controlled' type, and was the type generally in use throughout the First World War. The Ger. introduced a 'magnetic mine' in the Second World War, but one was washed up intact on the Brit. coast, and its secrets soon learned, with the result that all vessels were protected by a 'de-gaussing' girdle, which had the effect of de-magnetising or de-polarising the ship. Aircraft, too, were used in exploding magnetic mines by radio. Acoustic M. were also developed and used by both sides. Detonation was effected by the vibrations of a ship's propeller oscillating a contact arm within the mine. To sweep these an electrically driven hammer in a box fitted ahead of the bows was used; a Brit. type, however, was evolved which could distinguish the hammer vibrations

from those of a propeller, so proving almost impossible to sweep. M. are used in a variety of ways: minefields are laid to protect certain approaches, and estuaries of rvs. used by fleets are mined. A mine barrage consists of M. sunk at intervals of 10 ft. from just below the surface to a depth of about 90-100 ft. Such a barrage was designed in the First World War to catch capital ships on the surface and submarines down to a depth of 100 ft. Perhaps the most effective types of M. used during the First World War were the Amer. 'antennae' mine and the Vickers 'H' mine.

M. are laid from all kinds of vessels, including submarines. When the Ger. Navy in the First World War was kept confined to its own ports mine-laying by submarine was a possible counter-move, and in this the Ger. were very successful. Vessels designed for mine-laying have now been built and added to navies.

One of the most important and hazardous operations of war is that of mine-sweeping, carried out chiefly by trawlers. A single wire towed between two trawlers about 400-500 yds. apart is the usual method of sweeping. The Burney paravane came into use in 1917. It was a device which caught the mooring wire of the mine between steel teeth and cut it very quickly, thus releasing the mine to the surface, where it was exploded by fire at a safe distance from all craft. See J. Cowie, *Mines, Minelayers, and Mine-laying*.

Mines Rescue, see under RESCUE WORK.

Ming, dynasty of China which reigned from 1368, after the Mongols were expelled, until 1644. Its founder was Chu Yuan-chang, who estab. the cap. at Peking. The M. period was notable, not so much for creative work in letters, and art as for interest in and preservation of the work of the past. During this period the earliest contacts of the modern W. world with China were made by the Portuguese mariners, and by the Jesuit missionaries who followed them. The M. dynasty was eventually overthrown by the Manchurian dynasty. See further under CHINA, Chinese Art, on M. porcelain.

Minghetti, Marco (1818-86), It. statesman and economist, b. at Bologna. He entered the service of Pope Pius IX. after his election (1844), and was appointed member of the Consulta della Finanze. When Pius yielded to the demands of Austria, he resigned office and fought in the Sardinian Army in Lombardy. In 1859 Cavour appointed him secretary-general to the foreign office and subsequently minister of the interior (1861). After Cavour's death (1861) he succeeded to the premiership (1863), and concluded with Napoleon III, the Sept. Convention (1864). He was later minister of agriculture (1868) and Premier (1873-76). His writings include *Della economia pubblica* (1859); *La Chiesa e lo Stato* (1878); and *Miei ricordi* (1885).

Miniature-painting, usually applied to portraits painted on a very small scale. M. is generally executed on ivory and is, as to composition, drawing, and finishing,

subject to the same process as any other kind of painting, but the colouring, at all events of the face, is dotted or stippled on. The term miniature (from Lat. *mino*, to colour with red ochre) was originally applied, not to a small portrait, but to the highly specialised art of illustrating MSS. Each of the 250 miniatures in illustration of the celebrated Cottonian Genesis was about 4 in. square. Later the miniature became merely a large initial letter containing on or around it a pictorial representation on a small scale of some incident or person spoken of in the text. From this fact it is possible that the term miniature when it became exclusively applied to small portrait-painting on enamel, ivory, or any other material had become erroneously associated with Lat. *mino*, to diminish. Ivory is commonly selected for M., because the peculiar hue of the better kinds presents great facilities for the imitation of human skin, and indeed ivory may be regarded as the chief elementary tint that goes to the formation of the colouring of flesh. Before being used the ivory has to be prepared by rubbing it on pumice powder and water with a glass 'muller,' which gives it a 'ground' surface. The conversion of photographs into 'colour photographs' is, however, hardly the art of a Hans Holbein, for it consists in doing little more than add nature's colouring to what must perchance be regarded as nature's form; and most experts agree that to attempt to improve the photography by deepening shadows, or vice versa, usually detracts from the accuracy of the portraiture. Eng. artists have been conspicuous in the past as miniature painters, among the most notable being Isaac Oliver, whose miniatures are to be seen in practically every important portrait collection - he painted James I. and most of the contemporary court and nobility; Peter Oliver, his son, whose celebrated miniature, 'The Entombment of Christ,' was begun by his father and finished by the son; Richard Cosway (1740-1821), whose miniatures for snuff-box lids were famous; and Sir Wm. Ross (1791-1860), the king of Eng. miniaturists. See J. L. Probert, *History of Miniature Art*, 1887; G. C. Williamson, *Handbook of Portrait Miniatures*, 1897; J. J. Foster, *Chats on Old Miniatures*, 1908; F. R. Martin, *The Miniature Painting and Painters of Persia, India, and Turkey*, 1912; and O. E. Saunders, *English Illumination*, 1928.

Miniature Poodle, sub-variety of poodle (q.v.) which does not stand higher than 15 in. at the shoulder.

Minié, Claude Etienne (1814-79), Fr. inventor of the M. rifle, b. in Paris. He entered the army as private and rose to the rank of colonel (1858), having seen active service in Africa. The rifle bearing his name was invented in 1849.

Minieh (Minya), administrative div. of Upper Egypt, with an area of 782 sq. m., drained by the Nile. M. is the cap. situated on the Nile midway between Siut and Boni-Suef. It has manufs. of earthenware, and a gov. cotton factory. Pop. of div. 1,061,500; of tn. 70,000.

Minim, character or note in music, equal in duration to one-fourth of a breve, or two crotchets. Its name is derived from the fact that in ant. music this note was of the shortest duration (*nota minima*). A M. rest indicates silence for the duration of a M.

Minima, see MAXIMA AND MINIMA.

Minims, or **Minimi**, friars of the religious order founded by St. Francis of Paula. The rule is founded on that of St. Francis of Assisi. St. Francis of Paula founded his first convent in 1444, and the first rule was made in 1493. There are also second and third orders.

Minimum Wage. A M. W. is a rate of pay below which wages may not fall. It is fixed either by legislation or as a result of collective bargaining. To-day agitation to secure a M. W. is said to arise principally from the worker who seeks protection from parsimonious employers, but in the Middle Ages the employers sought protection from the excessive charges of craftsmen. Throughout the hist. of trade unions many disputes have a M. W. as their main object (see INDUSTRIAL DISPUTES), and trade boards (q.v.) have secured adjustments favourable to the worker. In 1524 there was municipal regulation of wages in large Eng. tns., and an Act of Parl. abetted marked a definite step in the progress of the movement. Under the Trade Boards Act of 1918 a large number of trades were included in M. W. decisions, and hitherto sweat labour was placed on a more favourable footing. The United Nations, through the International Labour Organisation, has (following the League of Nations) a special dept. which considers the question, and practically in every part of the world there is a movement in favour of a M. W. Many employers pay more than a M. W., and this fact tends to dispose of the suggestion that a M. W. is prone to become a maximum. In some trades the M. W. fluctuates according to the rise or fall in the cost of living, a sliding minimum scale being formulated.

There are in the U.S.A. where such scales are more numerous than in England, three methods of payment. The first gives an additional monthly percentage, increasing by 5 for every unit of rise according to the Bradstreet index number; the second calculates the proportionate increase of cost of living by a monthly comparison; while the third uses as a standard the average of the gov.'s index numbers for 1918. M. W. legislation was a part of the national recovery programme enacted under President Roosevelt in 1933. There are also M. W. ordinances in many Brit. colonies.

Mining. The term M. in its broadest sense, is the art of extracting useful minerals from the crust of the earth. It embraces (a) prospecting, which means to search; (b) exploration, which determines the extent of mineral deposit; and (c) development or exploitation, which deals with the method of working the deposit. The prin. products mined include the metalliferous ores of gold, silver, zinc, copper, lead, tin, etc., and the non-

metalliferous minerals such as coal, peat, gypsum, limestone, kaolin, marble, granite, precious stones, mineral oil, and oil shales. Those deposits occur in the earth in various ways. They may form (1) tabular or sheet-like deposits or (2) non-tabular or irregular masses. Further, a tabular deposit may occur as (a) a bed or layer, or (b) a vein or lode. Many of the most important mineral deposits occur as beds containing a valuable metal such as gold, copper, iron, or lead. The non-tabular deposits include the diamond-bearing 'necks' of old volcanoes: large 'bosses' of granite or masses of haematite.

The prin. methods of working mineral deposits are: (1) open-cast or surface workings; (2) open and underground workings combined; (3) alluvial or placer M.; (4) wells and boreholes; and (5) underground workings.

Open-cast M. is only possible where the mineral lies at or near the surface and is relatively flat. Among the minerals often worked by this method are coal, lignite, and the ores of gold, copper, iron, lead, and tin. Under favourable conditions the method is economical and reasonably safe. The first process is the removal of the overburden or rock covering the valuable bed of mineral. After this the mineral itself is excavated and removed. If the mineral is hard it will require blasting or breaking by machinery. Nowadays the overburden and mineral ore are worked by mechanical methods. Large power shovels, mounted on tractors and driven by electricity or steam, excavate and load the material into lorries, trucks, or conveyors. Dragline and bucket excavators are used for loose rock and alluvial and these can dig under water. The locomotive crane and bucket is also used for gravels and muds. The bulldozer is also used for clearing surface rubbish and for excavating earth. The removal of both overburden and mineral begins from the top downwards in successive horizontal slices, benches, or terraces, until the bottom is reached. In some cases the overburden is deposited in the trench previously occupied by the mineral. This is known as back-filling. In open-cast M. the ratio of overburden tonnage to mineral tonnage is a deciding factor in economical working.

A combination of open and underground workings is employed when the ore deposit is thick and pitches steeply from the surface. The actual workings are open but the ore is removed by underground levels and shafts. The so-called milling process is often adopted for working iron-ore deposits. While the overburden is being removed by shovels, etc., a shaft is sunk and cross-cuts driven into the deposit. At short distances along these levels small pits or rises are put up to the surface in the ore body. Workmen then excavate the ore around the top of each rise and shoot the ore into it. A door at the bottom of each rise enables large wagons to be loaded rapidly. These are then hoisted up the shaft. As the ore is worked each small pit takes the form of a funnel.

Alluvial or placer deposits are those filling up the floor of rvs., and consist of the sediment carried down by the water and deposited along parts where the current became sluggish. The material consists of layers of gravel, sand, and clay, and containing, perhaps, small quantities of gold, tin, or other metal. Practically all these are heavier than the sand and clay and can be separated by washing in sluices or by the more primitive methods of pan and rocker. The M. methods commonly used are dredging, sluicing, or

while the heavier and valuable metal settles to the bottom. Wood, stone, or iron riffles are fixed in the bottom of the sluices to collect the particles of metal. In the case of gold mercury is added to assist in trapping it. Washing tables are sometimes used instead of sluices. When a collection or clean-up is due the water is diverted into a parallel series of sluices, then the metal is collected and the mercury recovered and used again.

Hydraulic M. is used when the deposit is soft and lies under a loose overburden.



United States Information Service : American Embassy

OPEN-CAST MINING (IRON) IN MINNESOTA

At Mahoning mine at Hibbing, probably the world's largest iron producer. Men at the left are boring holes for dynamite charges with power-driven auger into the iron-bearing face of cliff. Such holes may also be bored vertically with different equipment. The men at the right are placing dynamite sticks in holes previously bored.

hydraulicking. Dredging consists of a float or barge for supporting the plant for bringing up the alluvial from the riv. bed. Machinery plays an important part in alluvial M. Shovels, grabs, scrapers, or dragline excavators are used when the deposit is thick. These machines excavate and deliver the material to the sluices or other appliances for separating the valuable metal from waste material. Dredging operations can now be carried down to depths of 130 ft. below pond level.

Another method is to divert the course of the riv. and work the alluvial by streaming. Riv. alluvial containing valuable metal is often treated in long inclined troughs or sluices in which a stream of water is kept flowing. The lighter particles of waste sediment are carried away

in this method, known as hydraulicking, strong jets of water are projected against the bank of gravels and overburden, which are loosened and washed away by the action of the water. Beds of gold or tin-bearing gravels are often hydraulicked. The method requires an ample supply of water at a high pressure. Huge reservoirs are often constructed for storing water. When the fall of ground is not sufficient the washings of gravel are forced up to an elevated tank connected to sluices supported on treppies. Liquid, soluble, or gaseous minerals are often extracted from the ground by means of wells or boreholes. The prin. minerals obtained in this way are natural inflammable gas, petroleum, salt, and carbonic acid. When under pressure

mineral oil will rise to the surface or it may have to be sucked up by means of pumps. Natural accumulations of saline water or brine can be tapped by wells or boreholes. A borehole has been put down to a depth of over 3 m. in search of oil.

In underground M. the method of working depends on whether the deposit occurs as a bed, vein, or an irregular mass. A steep bed is generally worked on the same lines as a vein. In the case of a thin vein dipping steeply the deposit is generally reached by a vertical shaft. In hilly country an adit or horizontal tunnel may be used. From the shaft level cross-cuts are drawn to the vein, usually about 100 ft. apart, vertically. From these cross-cuts drives or levels are made along the vein in both directions. Each level is provided with facilities for loading and transporting ore. Winzes are drivages to the dip of the vein, and raises to the rise. These are driven to prove the vein, for ventilation, and for working purposes. A raise is driven to meet or 'hole through' to a winze from the level above, thus forming a connection between the two levels. The levels, winzes, and raises cut the mineral vein into a series of rectangular blocks or pillars, each of which forms a unit that is afterwards completely or partly removed by M. operations. If the deposit is thick it is divided into a number of horizontal slices, each slice being in turn divided into rectangular blocks. The miner tries to locate his drivages in the valuable portions of the vein and leaving the barren rock as buttresses or pillars to support the sides of roof.

When working away the blocks of ore there are two typical methods, i.e. working downwards or underhand stoping, or upwards known as overhand stoping. The term stoping means working away any deposit in a series of steps. In underhand stoping the miner begins in the floor of the level and excavates the ore in a series of steps. Any waste rock is deposited upon platforms of timber (stulls) and the metal is drawn up into the level by a windlass. The chief disadvantage of this method is the cost of winding up the metal and water by hand labour, although machinery is often used. A cheaper way of underhand stoping is to start from the upper end of a winze in a series of steps as before, but the ore is allowed to roll down the winze into wagons in the level below. In overhand stoping work is commenced from a raise or from two ends of a winze. When a sufficient height has been excavated timber supports (stemples, stull-pieces) are fixed from wall to wall and covered with boards on which the dirt is thrown.

In filling-up methods the mineral is removed completely and its place filled with waste rock. In top-slicing and caving the deposit is extracted from above downwards. The top slice is worked out from under the hanging wall or roof which is temporarily supported by timbers. Having worked a certain area of mineral the timbers are withdrawn and the roof

allowed to collapse or cave in. The process is repeated slice by slice right through the deposit. A form called sub-drift caving is used when working thick hard ore bodies. In this process the ore is removed in vertical slices, starting from one side to the other. Obviously the actual method of working a mineral deposit depends upon a large number of geological and other factors. See also COAL; COAL-MINING; LIGNITE.

See J. E. Spurr, *Geology applied to Mining*, 1904; H. C. Hoover, *Principles of Mining*, 1909; C. Le Neve Foster, *Elements of Mining and Quarrying* (revised by S. II. Cox), 1910; H. Heise-Herbst, *Bergbaukunde*, 1911-14, and *Leitfaden der Bergbaukunde*, 1914; J. B. Mannix, *Mines and their Story*, 1913; Gruner, *Cours d'exploitation des mines*, 1922; Young, *Elements of Mining*, 1923, 1946; M. H. Haddock, *Mine Ventilation and Ventilators*, 1924; B. Berlinger, *Underground Practice in Mining*, 1928; II. de la Gouplière, *Cours d'exploitation des mines* (4th ed.), 1928; R. Peele, *Mining Engineers' Handbook*, 1942; T. Bryson and A. Harvey, *Science for Miners*, 1946; and Truscott, *Mine Economics*, 1947.

Ministry (Church), see BENEFICE; CLERGY; ORDERS, HOLY. (Political), see CABINET; GOVERNMENT; and under names of Mts., e.g. AGRICULTURE AND FISHERIES.

Mink, name given to some species of the weasel family. The Amer. M., *Putorius rison*, is larger than a stoat, and the fur varies from yellow to dark brown in colour. It is aquatic in habit, feeding on fish and small mammals. When attacked it produces a very offensive secretion. The European M., or marsh otter (*P. lutreola*), closely resembles the other species, its white upper lip being its chief distinction. If taken young Ms. are easily tamed, and have been used as ferrets. For the manufacture of fur coats, ties, and trimmings, the most desirable types of wild M. are found in Canada and N. America. The fur varies in colour from light to dark brown. Ms. are also raised in captivity, and compare very favourably with the wild types. In recent years few varieties have been developed. They are known collectively as mutation M., of which the most valuable are silver blue, pastel, and white.

Minlaton, tn. of Fergusson co., on the Yorke Peninsula, S. Australia, 26 m. S. of Port Victoria. Pop. 2000.

Minmi, tn. of New S. Wales, Australia, in Northumberland co., 7 m. W.N.W. of Newcastle. There are coal-mines near. Pop. 1700.

Minneapolis, largest city of Minnesota, U.S.A., and co. seat of Hennepin co., is situated on both banks of the Mississippi, at the falls of St. Anthony, and covers an area of 53 sq. m. It is the great centre of the wheat and flour trade; the immense water-power of the falls of St. Anthony, increased by locks and dams, being used in flour-milling. There are extensive manuf's. of machinery, carriages, furniture, boots, shoes, etc. M. contains one of the twelve federal reserve banks of the U.S.A. and is the seat of Minnesota

Univ.; owing to its picturesque neighbourhood it is a favourite holiday resort. The falls of Minnehaha, immortalised by Longfellow in his *Hawatha*, are near the city. Pop. 493,000. See C. F. Schmidt, *Social Saga of Two Cities*, 1937.

Minnesingers (Ger. *Minnesänger*, lovesingers), Ger. lyric poets who flourished about 1150 to about 1350. Their lays dealt not only with love, but also with other topics, such as country life, military adventure, and politics. The earliest M. were chiefly Austrian and Bavarian, and were often called the Swabian poets, because in their songs the Swabian dialect was prevalent. Their art spread rapidly throughout Germany, and in 1207 the famous *Sangerkrieg*, or 'Battle of the Bards' (celebrated in *Tannhäuser*), was held at the Wartburg in Thuringia, where the Landgrave Hermann I., held open court for all minstrel folk. Among the most famous M. were Friedrich von Hausen, Heinrich von Ofterdingen, Otto von Botenlaube, Heinrich von Morungen (the noble Moringer of the ballad), and above all Walter von der Vogelweide, whose songs were not only skilfully wrought but also imbued with strong national and political feeling. M. were generally of noble, sometimes princely, rank, but some were mere wandering minstrels. Ittigidor von Manesse, burgo-master of Zürich (d. 1304), collected nearly 1500 *Minnelieder*. The best modern selection is by F. H. von der Hagen (4 vols., 1838). See H. Brinkmann, *Entstehungsgeschichte*, 1926, and J. Siebert, *Dichter Tannhäuser: Leben-Gedichte*, 1934.

Minnesota: 1. The 'gopher state,' a N. central state of the U.S.A., bounded on the N. by Canada, on the S. by Iowa, on the E. by Lake Superior and Wisconsin, and on the W. by N. and S. Dakota. It has a total area of 84,068 sq. m., of which 5637 sq. m. are water. Its extreme length is about 400 m., and breadth 354 m. The surface in the S.W. portion is an undulating plain, well watered with lakes and streams. In the N. central part is a highland, called the Height of Land, with an elevation of 1300 to 2000 ft. The land slopes in all directions from this central elevation, and in the N.E. corner the Misquah hills reach an altitude of 2230 ft. Formerly the hills were entirely covered with immense forests; now the greater part of the saleable pines have been cut, though a large quantity of pines and hardwood still stands. The great rvs. of the state are the Mississippi, draining about two-thirds thereof, the Red R., forming the W., and the St. Croix, the E. boundary, and there are numerous minor streams, besides thousands of lakes, abounding in almost every kind of freshwater fish. The climate is particularly healthy, though there are wide extremes of temp. Average rainfall is 28*i*. in. per annum. Agriculture is the prin. industry, the long summer days being very favourable to the growth of grain, wheat, barley, oats, hay, rye, potatoes, etc., being the chief crops. M. usually ranks first in production of flax seed, and leads all states in production of creamery butter.

The chief fruits grown are apples and grapes. The iron ore deposits are the richest in the country. The prin. manufs. are flour and grain mill products, slaughtering and meat packing, butter, cheese, condensed and evaporated milk, motor vehicles, linseed oil, cake and meal, foundry and machine shop products, planing mill and timber products, paper and wood pulp, knitted goods, fur goods, agric. implements, boots and shoes, etc. The grain trade centre in Minneapolis ranks in the U.S.A. second after Chicago. Duluth is a great lake port for iron ore and cereals. It has enormous undeveloped water power, and productive fisheries of white fish and lake trout in Lake Superior.

History.—M. was explored by the Fr. as early as 1660; in 1686 Nicolas Perrot took possession of it in the name of the king of France. It was ceded to England in 1763, and became part of the U.S.A. after the revolution. It was first settled in the twenty years following the estab. of Fort Snelling (1819), was made a ter. in 1849 (with parts of N. and S. Dakota), and became a state of the Union (1858). There is a Senate of sixty-seven members and a House of Representatives of 131. Two senators and nine representatives are sent to Congress. It was largely settled in later years by Ger. and Scandinavian emigrants, descendants of the latter having often been elected to the highest posts in the state. M. has a most efficient system of public schools and the univ. of M., chartered in 1851 and opened in 1869, with an average enrolment of over 11,000 students, is among the best in the U.S.A. Other educational institutions include Hamline Univ., founded in 1854; St. John's (Rrom. Cathol.) Univ., at Collegeville; Carleton College, at Northfield; and St. Olaf College, also at Northfield. Pop. (1940) 2,792,300, (estimated 1944) 2,508,660, a decrease of over 10 per cent since 1940. Prin. tns.: Minneapolis, 492,370; St. Paul (the state cap.), 287,700; Duluth, 101,400; Winona, 21,000; St. Cloud, 21,000; Rochester, 20,000; Hibbing, 15,500. See W. W. Folwell, *A History of Minnesota*, 1921-26; T. C. Blegen, *Minnesota: its History and its People*, 1937; and Federal Writers' Project, *Minnesota: a State Guide*, 1938. 2. Riv. of U.S.A., rising in a series of lakes in M., and an affluent of the Mississippi. Its total length is 450 m. and it flows S.E. for about 320 m., the rest of its course being N.E.

Minnow (*Leuciscus phoxinus*), small fish common in most parts of Britain and throughout Europe. It is distinguished from other species of its genus by its small size, and by its brown and green colouring.

Minoa, see under *HIERACLEIA*.

Minoans, see under *CRIE*.

Minor, in Scots law a person under lawful age or majority. In Eng. law the term generally used is infant. As opposed to pupil it means a male over fourteen, or a female over twelve and under twenty-one. Ms. in this restricted sense are capable of consent, but are treated as persons of such inferior

discretion and judgment as to require legal protection. Pupillarity, on the other hand, is a state of total incapacity. A M. who has no curator (guardian) may validly enter into a contract to marry, or any other contract, lease his heritable lands, and give his movables to whom he will. But the acts of a M. who has a curator are, generally speaking, invalid without the latter's consent. Nevertheless he may, without such consent, do any act which does not affect the property under his curator's control.

Minor. in music, intervals having two forms which are alike consonant or alike dissonant are distinguished as major (q.v.) and M., the M. form being always a semitone less than the corresponding major interval. M. scales or modes are so named because their main characteristic is their third being M. The M. scale is a slight adaptation for purposes of harmony of one of the later modes of the Pythagorean system of scales. M. tones are less than major by a comma.

Minorca (Sp. Menorca), second largest of the Balearic Is., area 293 sq. m., in the Mediterranean belonging to Spain. Cereals and fruits are produced; there are good pastures, and horse and cattle rearing is carried on. Marble, alabaster, slate, copper, lead, iron, etc., are mined. In winter the is. is exposed to boisterous winds from the N. The cap. is Port Mahon, which has a splendid harbour. Pop. 45,700.

Minorities. Protection of, protection clauses in such treaties as the treaty of Berlin, 1878, and the treaties concluded after the First World War, have for their object the assurance of civil and political liberty to the minority subjects in newly created or newly recognised states, irrespective of the religious creeds of such subjects. By the treaty of Berlin the great powers recognised the four Balkan states *subject* to a condition for the P. of M.; but mutual suspicion and juristic difficulties prevented concerted action for the enforcement of the condition. The treaties after the First World War also contained provisions by which the new states, namely Czechoslovakia, Yugoslavia, and Poland, undertook to ensure to all their subjects equal civil and political privileges without distinction of race, language, or religion, and similar minority clauses were included in treaties entered into by Austria, Rumania, Hungary, Greece, and Turkey; while the obligations imposed by such clauses were voluntarily accepted by the Baltic states, Lithuania, Latvia, and Estonia, and also by Albania, on their admission to the League of Nations. The acceptance of such obligations implied some derogation from sovereign independence; hence to mitigate the implication and also to obviate the difficulty which rendered the analogous clauses in the Berlin Treaty nugatory, it was provided that the stipulations regarding M. 'constitute an obligation of international concern and shall be placed under the guarantee of the League.' The League referred alleged breaches to a special section of its secre-

tariat and legal difficulties to the Permanent Court of International Justice. This system was sound in so far as it might remove the excuse by an outside power of intervention on behalf of oppressed M., which is a frequent source of war; but its weakness lay in the fact that it was not calculated of itself to impress on M. the duty they owed to co-operate with majorities in the states to which they belonged or to which they had been assigned.

The growth of extreme nationalism, coupled with the development of authoritarian or totalitarian forms of gov., seriously compromised the position of M. in Europe in the decade preceding the Second World War. The M. which provided the chief source of international friction were the Jewish and Ukrainian M. in Poland, the Sudeten Gers. in Czechoslovakia, the Russian, Ger., and Polish in the Baltic states, the Ger., Magyar, and other M. in Yugoslavia, the Gers. in Alsace-Lorraine, and the Gks. in Albania. In 1938 Germany and Poland concluded an agreement which purported to give their respective M. a small measure of cultural and general rights, but this agreement meant no more on Germany's part than the beginning of a provocative claim every where in Europe, and indeed in the world, to control Ger. M. on the principle that *Volkstum* or personal nationality was the incontrovertible right of all their nationals. By that year the system of protection of M. had virtually collapsed owing to the wane of the League Council's political authority, a loss of authority which adversely affected the Jewish M. in Germany and Rumania (See ANTI-SEMITISM.). The Ger. claim to act as the protector of all Ger. M. dwelling outside the Reich was nowhere more impudently asserted than in Czechoslovakia, where its development led directly to the absorption of the whole country in the Reich despite concessions by the Czechs which seriously encroached on the sovereign status of their state. (See CZECHOSLOVAKIA.) In 1939, when Russia availed herself of the European war to establish a protectorate over Estonia (as over the other Baltic States), the Ger. minority was removed to Germany.

As the result of the Second World War and subsequent political changes there has been a great change in the position of M. Some have ceased to exist as such (some Balkan states having deported their M.); some have become a dominant element; others have passed to new masters, and new ones have been created; but so far from being solved the problem they constitute is greater than ever. The rights of M. were formerly entrusted to a special section of the League of Nations. A large number of treaties and declarations relating to international engagements to prevent discrimination and protect M. were the outcome of League action in one form or another. In 1948 it was proposed that the United Nations should seek the advice of the International Court of Justice as to the rights and obligations still arising from them. In seeking to define, in a projected Bill of Human

Rights, more precisely such terms as the prevention of discrimination and the protection of M., the United Nations Commission on Human Rights realised that there were many different types of M. It is necessary to distinguish whether the groups affected by discriminatory measures are of recent or old formation and whether in the past they have constituted M. in active opposition. It is also necessary to distinguish between the true M., and those created for purposes of propaganda. A minority is not necessarily the smaller, but is simply the non-dominant group, and may or may not desire assimilation. There are sev. cases of M. who merely wish to be left alone to pursue their own mode of life; the Indians in S. Africa are a case in point. Again colonial administration has sometimes retarded native development merely from a desire not to interfere with the affairs of the native pop. The question of protection is equally complicated. Those that seem likely to need it in the near future are more in the nature of political M. than the traditional religious sects, which tend to disappear. 'Protection of minorities,' it has been ruled, 'is the protection of non-dominant groups which, while wishing in general for equality of treatment with the majority, wish for a measure of differential treatment in order to preserve basic characteristics which they possess, and which distinguish them from the majority of the pop.' The characteristics inheriting such protection are race, religion, and language.' To qualify for such protection a minority must owe undivided allegiance to the state in which it lives, and its members must be nationals of that state. The grievances of M. are usually brought to the public notice by means of petitions. In view of known examples of victimisation the United Nations Organisation has found it necessary to keep them secret. See Lord Birkenhead, *International Law*, 1927; League of Nations, *Protection of Linguistic, Racial, and Religious Minorities by the League of Nations*, 1927; O. Junghann, *The Origin and Solution of the Problem of National Minorities*, 1929; A. N. Mandelstam, *La Protection internationale des minorités*, 1931; C. A. Macartney, *National States and National Minorities*, 1931; and E. Wiskemann, *Czechs and Germans*, 1938.

Minority, see REPRESENTATION.

Minos, anct. king of Crete regarding whom the legends were so contradictory, ascribing to him the most eminent virtues together with monstrous cruelty and tyranny, that poets and historians solved the difficulty by supposing two kings of the same name. One, a favourite of the gods, was after death appointed supreme judge in the realm of the shades; the other, connected with the story of the Minotaur (q.v.), was killed in Sicily, whither he had gone in pursuit of Daedalus. Anct. legends, once looked upon as entirely mythical, have been proved by Dr. Schliemann and others (see CRETE) to have their foundation in fact. There were sev. Minoan dynasties, and, possibly M., like Pharaoh, was a dynastic title.

Minot, George Richards (b. 1885), Amer. physician, b. in Boston and educated at Harvard. Prof. of medicine at Harvard from 1928, before this he was physician-in-chief at the C. P. Huntington Memorial Hospital, Harvard, 1922-28; he was also director of the Thorndike Memorial Laboratory, and visiting physician at the Boston City Hospital from 1928. He was awarded, jointly with Wm. P. Murphy and George H. Whipple, the Nobel prize in medicine (1934) for researches on the liver treatment of pernicious anaemia. He has pub. sev. works on the blood and its disorders, and dietary deficiency.

Minot, Lawrence (c. 1300-52), Eng. poet, the author of eleven songs celebrating the triumphs of Edward III. They are written in the Northumbrian dialect, with a sprinkling of Midland forms, and were first pub. by Joseph Ritson in 1795 under the title *Poems on Interesting Events in the Reign of King Edward III.* See ed. by J. Hall (2nd ed., 1897) and T. Wright, *Political Poems and Songs*, 1859.

Minot, city of N. Dakota, U.S.A., in Ward co., 100 m. N.W. of Bismarck. It is a shipping port for coal and grain. Pop. 16,500.

Minotaur, fabulous monster, half bull and half man, said to have been confined by Minos II. in the labyrinth at Cnossus, and fed upon the flesh of young men and maidens sent as an enforced tribute from Athens. Among the ruins of Cnossus have been found Minoan wall-paintings of bull fights and figures of a similar monster.

Min River, riv. of China in the prov. of Fukien. It flows in a S.E. direction after leaving Yenping, and enters the sea about 30 m. below Foochow. It is navigable by small native boats for most of its course. Length 375 m.

Minshat, El, see MENSHEYEH, EL.

Minsk: 1. Region of the Byelorussian S.S.R., with an area of 35,220 sq. mi., two-thirds of which are composed of marshes, lakes, and marshy forests of stunted trees. The N. part of the region is higher and well timbered; through this area runs the railroad from Warsaw to Moscow, on which M., the cap., has an important station. The marshy dists. (called Polyesia) are extremely unhealthy, and have not much cultivation, the inhab. depending mainly on the timber trade, fishing, and hunting. The chief rvs. are the Beresina and the Pripet, trib. of the Dnieper. Pop. 3,071,000. 2. Cap. of the Byelorussian S.S.R., lies at the junction between important railway lines from Moscow and the Ukraine to Warsaw and Königsberg. It contains machine-building, wood-working, shoe, and leather factories. Also at M., as at Vitebsk, articles which require relatively small quantities of metal, lathes and needles, for example, are manufactured. The tn. is the seat of the White Russian State Univ., and the headquarters of the army of the W. Pop. 239,000 (1939). M. has suffered greatly from ravages wrought by various invaders. From the eleventh century it has repeatedly changed hands, and it has more recently suffered from the revolution of 1917 and the two

world wars. See further under EASTERN FRONT IN SECOND WORLD WAR.

Minster (Lat. *monasterium*, Ger. *Münster*), church attached to a monastery or forming part of it. The name is now applied in England to certain large churches or cathedrals, such as those of Westminster and York.

Minster in Sheppey, vil. of Kent, England, in the Isle of Sheppey, near the N. shore. It is noted for its fossils, particularly fruit, from the London Clay. Pop. 2000.

Minster in Thanet, vil. of Kent, England, on the R. Stour, 4 m. W. of Ramsgate. It possesses an ant. par. church, which was attached to a nunnery founded in 670, and a monastic grange. Pop. 2800.

Minstrels, itinerant musicians and poets akin to the Fr. *jongleurs*, flourished from the tenth to the fourteenth centuries. It is suggested in Grove's *Dictionary of Music* that the term was derived from the Lat. *minister*, a servant, since minstrels were employed as such by the troubadours and minnesingers, many of whom were of noble birth. Their duties consisted chiefly in playing accompaniments for their masters. The original word seems to have been *ménestril*, a term introduced in the fourteenth century to denote a higher class of musical entertainer than the older " *trouer*, and out of this word grew the word *menestrel* for a profession which had wide differences of social importance from humble wanderers to well-paid permanent servants of great nobles or of royalty (see P. Scholes, *Oxford Companion to Music*, 1911). Gradually the term came to embrace all travelling musicians and bards; they were welcomed by all classes, and by the end of the thirteenth century the chief houses had permanent staffs of M. Partly on this account and partly by reason of the spasmodic censure of the church, the itinerant class sank into disrepute, and were classed as ordinary beggars and rogues. The art received its final death-blow from the institution of play-houses and the introduction of printing. See also JONGLEURS; MEISTERSINGERS; MINNESINGERS; TROUBADOURS; TROUVÉRES; MUSIC AND SONG. See J. J. Jusserand, *English Wayfaring Life in the Middle Ages* (Eng. trans.), 1891; E. K. Chambers, *Medieval Stage*, 1903; E. Duncan, *Story of Minstrelsy*, 1907; and G. Borrow, *Wild Bards*, 1924.

Mint (*Mentha*), large genus of aromatic plants (family Labiate). Spearmint (*M. viridis*) is grown for its shoots and leaves, which are utilised for culinary purposes. It can either be grown in the open garden in a moist rich soil and dried and stored for use, or it can be forced by placing the roots in boxes of rich soil in a temp. of about 60°, and keeping moist. The Brit. species are variable, and hybridise with one another rather freely. Among those with the whorls crowded into terminal spikes are round-leaved M. with sessile wrinkled leaves; horse M., which is much more agreeably scented and has ovate leaves; and the very common hairy M. Corn M. and the marsh-whorled M. have the whorls of flowers separate and occurring in the axils of leafy bracts. The ent-

mixts form the genus *Nepeta*. See PEPPERMINT.

Mint. The twin pillars of the Brit. monetary system are the Bank of England and the Royal M. The bank furnishes the bank-notes and governs the quantity of bank-money; the M. mints, and supplies the metal coin. About A.D. 1000 there were some seventy Eng. Ms., but following the Norman Conquest and the improvement of communications their number dwindled. Ms. at Canterbury, Durham, and York survived into Tudor times; and during the Civil war Charles I. set up his own Ms. at Oxford and elsewhere, while Parliament continued in London to mint, and issue coin impreserved with the royal head.

There were Ms. in Britain before the Romans came, and from Rom. times onwards there was always a M. on Tower Hill. In the tenth century King Athelstan made this his prin. M. In 1811, in order to enjoy the advantages of steam-power, the M. was removed from the Tower for its present home on Tower Hill. Boulton, of the engineering firm of Boulton & Watt, was responsible for the installation. The building, on the site of a Cistercian Abbey, was designed by John Johnson and erected by Sir Robert Smirke. The Tower M. had, in the seventeenth century, installed screw-presses and other machinery like that already in use in France. The new equipment enabled the M. to give coin the now familiar milled edge which was to prove so effective a handicap to the coin clipper, whose pecuniary activities had for so long been a source of grave loss to the Crown. The nineteenth century saw the introduction of modern weighing machines and, in the eighties, a large building extension and the installation of modern presses. In 1840 the M. was 'nationalised,' and 1870 brought further changes; the Coinage Act of that year, besides consolidating the law regarding coinage, gave the title of Master of the M. to the chancellor of the exchequer and charge at the M. to a Deputy-Master and Comptroller. Prior to nationalisation the work had been done under contract, with severe penalties for the issue of coin that failed to meet statutory requirements. Contracting was profitable, Sir Isaac Newton, who was Master of the M. from 1699 to 1727, amassing a considerable fortune. Sir John Herschel was another famous Master.

The prin. operations of coining are: (1) melting the assayed metal into a prescribed composition and casting it into bars of suitable size for making the particular coin; (2) rolling the bars into 'fillets' of coin thickness; although the rollers exert a pressure of many tons they have an accuracy of 1/10,000 in.; (3) cutting blank disks of due diameter and weight for the coin required; (4) annealing the blanks in gas furnaces; (5) blanching them in dilute acid to remove the oxide acquired in the furnace; (6) impressing the (cold) blanks with the authorised designs (and milled edge) in 70-ton presses capable of stamping upwards of 100 coins a min.; (7) weighing (silver) coins on machines

which class them automatically as heavy, correct, or light. After being rung on an anvil and viewed by an overseer the approved coins are ready for 'telling' (counting) and packing. Silver coins are sold to the Bank of England and bronze coins to the other banks. Gold coin is no longer made. Up to the First World War the right of individuals to bring gold to the M. to be coined into sovereigns was, though little exercised, a notable feature of the gold standard. The restored gold standard (1925-31) did not restore gold coin. The M. supplies coin to Britain, dominions and colonies; as well as to foreign countries. It still makes a coin dated as long ago as 1780, when Maria Theresa of Austria was empress of the Holy Rom. Empire. This is the Maria Theresa silver dollar which still enjoys a wide circulation in parts of N. Africa. Medals, seals of State, and revenue stamp plates are also made at the M. See also PYX, TRIAL OF THE.

Minto, Gilbert Elliot, first Earl of (1751-1814), was b. at Edinburgh. Educated in Paris, Edinburgh, and at Oxford, he was called to the Bar in 1767, and entered Parliament in 1776 as a Whig. He was an associate of Burke, and took part in the impeachment of Warren Hastings. In 1777 he succeeded to his father's baronetcy, and in 1797 was created Baron M.; became governor-general of India in 1806, and held that post with great ability. Returning home in 1813 he received an earldom, and at his death was buried in Westminster Abbey.

Minto, Gilbert John Elliot-Murray-Kynynmound, fourth Earl of (1847-1914), Brit. administrator, eldest son of third earl. Educated at Eton and Trinity College, Cambridge, he served three years in the Scots Guards. He was in Paris during the Commune and in Spain during the Carlist fighting. He was with the Turkish Army fighting Russia, 1877; with the Brit. in Afghanistan, 1879; and a volunteer, 1882, at Tel-el-Kehir. Military secretary to Lord Lansdowne, Canada, 1883-85; he succeeded to the earldom, 1891. Governor-general, Canada, 1898-1904. Viceroy, India, 1905-10. See also INDIA, History, and MORLEY-MINTO REFORMS. See memoir by J. Buchan, 1924.

Minton, name given to a soft and hard paste porcelain ware first made by Thomas and Herbert M. at Stoke-on-Trent. Thomas M. began work as a potter there about 1790, at first devoting his efforts to Nanking blue-printed white ware. Later the firm, known as Campbell & Hollins from 1814 to 1868, produced *della Robbia* ware, Palissy ware, and beautiful encaustic tiles noted for their decoration and colouring. In 1871 the firm was joined by Carrier de Belleuse and Marc Louis Solon, and the artistic quality of M. ware was then markedly enhanced. Solon produced very fine *pâle-sur-pâle* work with very delicate effects. His pieces are mostly cups, vases, and plaques. M. majolica is noted for its bold modelling and excellent colouring. The name M. is impressed on earthenware and faience, with special marks for different ware.

Minucius, Felix Marcus, very early Christian apologist, remembered only for his *Octavius*, a dialogue between Cecilius, a pagan, and Octavius, a Christian, with Felix as arbiter. In the arguments for and against polytheism Octavius is declared victor.

Minuet (from It. *minuetto*, through Fr. *menuet*, small, dainty), graceful dance for two persons, supposed to have originated in Polton, France. It was set to music in $\frac{3}{4}$ time, and was performed slowly, and with much dignity. The name is also applied to the musical composition written to the time and rhythm of the dance, and is frequently introduced by Handel and Bach into suites. Beethoven developed it into the scherzo.

Minuscules, small letters developed from ancient, uncial and cursive alphabets. Writing being used for business as well as literary purposes, two styles became distinct, the rapid cursive and the formal book-hand. In the ninth century the M., which had been gradually evolved during previous ages, practically superseded the uncial lettering for general use, though in scholastic and religious books much of the latter was retained. As time went on both Lat. and Gk. M. became still smaller and more flowing. Our present Eng. handwriting is mainly founded on the It. fifteenth-century style.

Minusinsk, tn. in the Krasnoyarsk Ter., R.S.F.S.R., near the Yenisei, 328 m. S. of Krasnoyarsk. The area is rich in coal; leather and tallow are produced. Pop. 10,500.

Minute (Lat. *minutus*, small): 1. Of time, being the sixtieth part of an hour. 2. Of an arc, being the sixtieth part of a degree in the measurement of a circle.

Minute Men was a popular title for the soldiers of the militia during the Amer. War of Independence, and refers to their hasty preparation for war (at a minute's notice). The first contest of the war was between M. M. and Brit. troops, at Lexington.

Minya, prov. of Upper Egypt, takes its name from a tn. 110 m. S. of Cairo, on the l. b. of the Nile. Area 782 sq. m. Pop. 1,061,100 (of tn. 51,000).

Minyæ were a Gk. race of heroes, celebrated in the ancient epics. Their founder was Minyas, the king of Brotia, and their headquarters was Orechomenos, though Iolchos in Thessaly was a famous settlement. Their descendants, the Argonauts, who founded a colony in Lemnos, often called themselves M.

Miocene (Gk., less recent), geological name for the middle div. of the Tertiary strata lying between the Oligocene and the Pliocene, and the geological period it represents. It contains fossils of living species in intermediate ratio (25 per cent., Lyell). There are no large deposits of this age in the Brit. Isles, but small beds are found at Bovey Tracey and in the is. of Mull. Elsewhere they are widely distributed over the world. They consist of sandstones, gravels, clays; limestones, marls, clays, and sands; and contain marine shells, mastodons, rhino-

ceroses, lions, apes, deinotheria, three-toed horses, camels, beavers, tapirs, etc., conifers, beeches, oaks, maples, walnuts, poplars, magnolias, etc. The Oeningen beds in Switzerland have contributed largely to our knowledge. In 1948, on Rusinga Is. in Lake Victoria, part of the fossilised skull of a M. ape was found, the study of which suggested that apes developed from the monkey group. Lamb bones found in the same region point to the fact that apes of the early M. had not an arboreal life. The period of formation, the *M. epoch*, was that of the final uplifting of



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MIOCENE APE

Remains of the skull and jaw of an ape discovered in 1948 on Rusinga Island in Lake Victoria

the present great mt. chains. In Europe the formation is estuarine and lacustrine mainly, and indicates a configuration of shallow seas and large inlets very different from the present. The climate resembled that of India and Australia. Palms, magnolias, acacias, firs, evergreen oaks, were among the typical vegetation; insect life was larger and more varied. During this epoch Britain remained land subject to inundation, and the evidence of the removal of hundreds of feet of solid rock by this slow process gives some idea of the duration of the period. There are signs of a gradual cooling of the climate towards present conditions, but the more tropical times are represented by beds of coal in Greenland and Spitsbergen. In Britain the chalk hills remain as evidences of the earth movements of the time.

Miquelon, Great and Little, Is. off the S. coast of Newfoundland, forming with the adjacent is. of St. Pierre a Fr. colony, and comprising a total area of 83 sq. m. G. and L. M. are connected by a narrow isthmus. The inhab. are almost entirely

occupied with the fisheries, the is. being barren and rocky and unfit for agriculture. Silver-fox breeding has been commenced. Cap. St. Pierre. Pop. 550.

Mir, name of a vil. community of old Russia. There were three classes of local elected bodies in Russia which had administrative functions, the *mir* and the *rolost*, the *cuisros*, and the municipal *dumas*. The M. consisted exclusively of all the peasant householders of the vil. These elected a *starosta*, or head man, and a collector of taxes. A number of Ms. united formed a *rolost*, or canton, with an assembly of delegates elected from the different Ms. The institution of the M. was of very great antiquity, but the patrimonial jurisdiction of the landowners was not withdrawn from it until the emancipation of the serfs in 1861.

Mira, see Omuron Ceti.

Mirabaud, Jean Baptiste (1675-1760), Fr. littérateur, b. in Paris. He first became a soldier, and later acted as tutor to the daughters of the duchess of Orleans. In 1724 he pub. a trans. of Tasso's *Jerusalem Delivered*, and two years later was elected a member of the Fr. Academy. He also wrote *Alphabet de la sçc gracieuse*, trans. the *Orlando Furioso*, and pub. sev. philosophical and other treatises.

Mirabeau, André Boniface Riquetti, Vicomte de (1754-92), brother of the great statesman, joined the Fr. Army, where he distinguished himself mostly by insolence and extravagance. Taking part in the expedition which assisted the Amer. revolution in 1781, in 1789 he became a deputy to the States-General, where as a reactionary he bitterly opposed his brother. His corpulence and drunken habits won him the name of Mirabeau Tonneau (the Barrel). He emigrated to Germany in 1790.

Mirabeau, Honoré Gabriel, Comte de Riquetti (1749-91), one of the greatest figures of the Fr. Revolution, b. at Bignion, was a son of Victor, marquis de M. (q.v.). After a stormy youth, during which his father sev. times procured *lettres de cachet* for his imprisonment, he escaped all former offences by running away with Mme de Monnier, he himself being already married. After a brief sojourn in Switzerland the two went to Holland, where M. earned a living by literary work. Having replied to his father's denunciations by some violent libels, he was arrested in defiance of international law and imprisoned at Vincennes for over three years. Here he wrote his famous *Lettres de cachet* in the blank leaves of books allowed him, and concealed the Ms. in the lining of his clothes. Coming for a time to England, he subsequently obtained leave to return to Paris. In 1786 he was sent on a secret mission to Berlin. Soon after his return he wrote an essay on *La Monarchie prussienne*, and later pub. a full account of his mission, with all his private reports. This and other indiscretions led to his exile from Paris. But when the States-General were convened (1789), being rejected as a representative by the Provençal noblesse, he appealed to the people, and became deputy

for Aix. Then came the great period of his career. In spite of his wild character he had strong practical views in politics, despising empty chatter, and deprecating extreme measures on either side. His power with the people was immense, yet he sought to use it not to overthrow but to remodel the monarchy somewhat on Eng. lines. Had he lived a few years longer, and had the court followed his advice, the Reign of Terror might have been averted.

In the many speeches which he delivered in the Constituent Assembly he revealed a remarkable power of improvisation, and an impetuosity of address and imagery exactly calculated to carry away his audience. He has been accused of bombast and of theatrical and commonplace metaphors but, even if he was guilty of such faults, correctness of form and literary polish would have been feeble substitutes for the style of oratory which was so effective in his day. A collection of his *Oeuvres oratoires* was pub. in 1819. Besides his speeches there are many letters, among them *Lettres originales écrites du doujon de Vincennes* (*Lettres de cachet*) and the *Lettre de Mirabeau à un de ses amis en Allemagne*. See T. Carlyle, *French Revolution*, 1839; H. Reynald, *Mirabeau et la Constituante*, 1873; C. W. Warwick, *Mirabeau and the French Revolution*, 1905; and Antonina Vallentin, *Mirabeau: Voice of the Revolution*, 1949; also lives by L. Barthou (Eng. trans., 1913); H. de Jouvenel, 1930; and P. Nezelof, 1937.

Mirabeau, Victor Riquetti, Marquis de (1715-89), Fr. political economist, b. at Pertuis in Provence. As an author his *Théorie de l'impôt* brought him a term of imprisonment, and afterwards seclusion on his estate, but continuing to write he founded a school of political economy. His health and fortune were finally ruined by constant family quarrels and lawsuits. He was the father of the famous Honoré.

Mirabella: 1. Tn. of Italy in the prov. of Avellino, 13 m. S.E. by E. of Benevento. Pop. 8000. 2. Tn. of Sicily in the prov. of Catania, 6 m. N.W. of Caltagirone. Pop. 5500.

Mirabilis, genus of perennial plants (family Nyctaginaceae). *M. jalapa* is the Marvel of Peru, a fragrant garden plant with flowers of various colours.

Miracle Play, term used in England for the plays dealing with scriptural and sacred subjects from about the thirteenth century to the end of the sixteenth century. In France the term miracle was restricted to dramas dealing with the lives of the saints, while the scriptural plays were known as 'mysteries.' The origin of the M. P. must be sought in the dramatic representations of the great events of the Christian year rendered liturgically in churches, especially at Christmas and Easter. The earliest example we have of such a liturgical drama dates from the year 967 (see J. M. Manly, *Specimens of pre-Shakespearian Drama*, 1900-3), and from this time the development is steady, blending both Norman and

Saxon lines of growth. The stagecraft of the church dialogues became more and more elaborate, until they had to pass into the open. Here the clerical element diminished, and lay actors took the place of priests and cantors. During the eleventh and twelfth centuries the M. Ps. passed into the monastery schools for teaching purposes. Originally all these plays were in Lat., and were dedicated to St. Nicholas, the patron of youth, but in the twelfth century they were interspersed with Fr. The institution of the festival of Corpus Christi in 1264, but not commonly observed in England till a good many years later, gave a great impulse to pageantry, and the great 'cycles' of plays are nearly all connected with this feast. The 'cycle' consisted of a series of plays dealing with events from the Creation onwards, and each play was acted on a 'pageant' or stage of two storeys on wheels, which was dragged from place to place for the repetition of the drama. There are four main cycles extant, all showing traces of continuous reaction. The York cycle (fifteenth-century Ms.) consists of forty-nine plays, the Wakefield or Townley plays (MS. 1450) are thirty-two in number, the Chester cycle (MS. 1175) has twenty-five, to be acted not at Corpus Christi but at Whitsuntide. The Coventry cycle (with forty-two plays) dates from the latter half of the fifteenth century. The plays were acted by the city companies, each company or guild being responsible for the production and acting of one play. The miracles are marked by considerable dramatic skill, and show in a somewhat undeveloped form the treatment of all the main dramatic motives. A particular feature is their realism. See K. L. Bates, *English Religious Drama*, 12-23; A. W. Pollard, *English Miracle Plays*, etc., 1895; E. K. Chambers, *The Medieval Stage*, 1903; E. H. Moore, *English Miracle Plays*, 1907; and in Everyman's Library series, *Everyman, with other Interludes*, 1909.

Miracles. According to the definition of St. Thomas Aquinas, 'miracle is a happening outside the order of all created nature; therefore God alone can work miracles by His own proper power, since He alone is not a creature.' In the early and Middle Ages M. were considered as the most cogent proof possible of the truth of Christianity. Now, however, what was once one of the chief reasons for giving assent to the Christian faith has become one of the chief obstacles to its acceptance, and there has come into being a school of apologists, including some of the foremost churchmen of the time, who have done their best entirely to remove the element of mystery and the miraculous. The generality of critics, however, are not disposed longer to continue the task of removing the supernatural from the natural in the N.T. narratives. Spinoza was the first in modern times to make a vigorous attack on the credibility of M. His statement on the subject is that 'nothing happens in nature which is in contradiction with its universal laws,' and thence, since M. are a violation of the

laws of nature, he argues that they cannot happen. The logical force of this argument is vitiated by the initial pre-supposition that 'nature' does not include non-material concepts, which is really the point at issue. The Eng. deists also denied the possibility of M. Hume accepts the argument from experience, and turns it against Christians by appealing to the 'firm and unalterable experience' which has estab. the laws of nature, and goes on: 'The consequence is that no testimony is sufficient to establish a miracle, unless the testimony be of such a kind that its falsehood would be more miraculous than the fact which it endeavours to establish. Or, briefly, it is contrary to experience that a miracle should be true, but not contrary to experience that testimony should be false.' Here again the point in question is taken for granted. As Paley pointed out - if by experience Hume means *all* experience, he begs the question; if he means general experience, he has merely proved what was never disputed, viz. that M. are uncommon. Strauss attempted to explain the N.T. M. as myths growing up in the minds of the disciples in accordance with their preconceived notions of the Messiah. The modern attitude to M. can briefly be summed up in the w^{ds} of Matthew Arnold, 'miracles do not happen.' On the other hand, the position of a present-day apologist is well given in the words of Dr. Figgis (*Gospel and Human Needs*, ed. 1912, p. 12). 'Miracles are but the expression of God's freedom; the truth that He is above and not merely within the order of nature. Disbelief in them really leads on to pantheism.' The literature of the subject is enormous. See especially writings of Hume, Pascal, Butler, Paley, Trench, Mill, M. Arnold, Westcott, Bruce, Newman, and Hillingworth. J. M. Thompson, *Miracles in the New Testament*, 1911; E. O. Davies, *The Miracles of Jesus*, 1913; A. Richardson, *Miracle Stories of the Bible*, 1943; and C. S. Lewis, *Miracles*, 1947.

Miraflores: 1. Tn. of Columbia, S. America, in the state of Boyaca. Pop. 14,000. 2. Seaside resort of Peru in the prov. of, and 4 m. S. of, Lima, of which is it one of the environs. It is becoming an important shopping centre. A motor road runs from Lima through M., Barranco, and Chorillos to La Herradura, also a bathing resort.

Mirage, name given to various phenomena due to reflection and refraction of light in unusual states of the atmosphere; commonest and most striking in regions of calm subjected to great heat or cold, e.g. hot and cold deserts and polar regions. Generally speaking, two strata of different densities lying sturdily one over the other give rise to two images, one direct and usual, the other an inverted reflection from the surface of contact. Thus clouds may be reflected from a thin stratum of dense air on the sand of deserts at sunset and after, giving the appearance of water; the convectional currents of air give a shimmering or wavy appearance, thus adding to the illusion. At sea the

layer of air on the water may in calm weather remain warmer for some height, giving an inverted reflection from above of ships below the horizon. In the early morning the latter effect occurs over deserts, the former at sea. It is quite possible to find Ms. over roads in England by placing the eye a few inches above the ground, e.g. in calm, hot weather, when the air is quivering. *Looming* is a form of M.; the object appears nearer and larger; it is well known at sea, when objects below the horizon are yet visible. Special instances are the 'Spectre of the Brocken' and the 'Fata Morgana' (q.v.). Owing to the rays of light coming over great distances, and the variation in density being gradual, they are curved, and the image will be seen along the tangent of the ray at the eye; this accounts for the displacement.

Miraj, state of Bombay Prov., India. Area 564 sq. m. Pop. 125,000. M., the cap., stands near the Kistna, 70 m. W. of Bijapur. Pop. 26,100.

Miramichi, riv. of Canada, rising in New Brunswick. Its course of 220 m. is generally N.E. It discharges into Miramichi Bay in the gulf of St. Lawrence. The port of Chatham (q.v.) stands at its mouth, and in the upper part of the riv. much salmon and trout fishing is carried on.

Miranda, or *Sá de Miranda*, Francisco de (c. 1495 c. 1558), one of the earliest Portuguese poets, studied law at Lisbon. He wrote in the 'It. style' (using the metres of Dante and Petrarch), but mainly in Castilian. His poetical epistles and elegies are his most noted works. He also wrote lyrics, sonnets, and comedies. See his *Collected Works* (ed. 1595), also M. Vasconcellos' ed. with biography, 1885.

Miranda, Francisco Antonio Gabriel (c. 1752-1816), Venezuelan patriot and general, descendant of the dukes of Miranda who, through their connections with the Caraccioli, came from the same line as St. Thomas Aquinas. He accompanied Bernardo Galvez, Sp. governor of Louisiana, in the expedition against the Eng. in Pensacola. In 1787 he visited the court of the Empress Catherine of Russia, who invited him to remain as an officer of the Russian Army. His real ardour, however, was to become the liberator of Sp. America and he departed from Russia to seek an audience with Wm. Pitt the Younger, who was not impressed with the practicability of his dreams of Sp. Amer. independence. When the Fr. Revolution broke out he became a general in the Fr. army and, under Dumouriez, fought in the campaign against the Prussians which culminated in the battle of Valmy (1792). He besieged and captured Antwerp and, in the absence of Dumouriez, acted as commander-in-chief of the Fr. armies. At Neerwinden he was forced to retire, was arrested and tried before a revolutionary tribunal in Paris but was absolved and, later, fled to England where he again visited Pitt and resumed his activities on behalf of the independence of Lat.-America. He estab. secret societies, such

as the *Gran Reunion Americana*, with which the Lautaro Society was later (1812) affiliated and continued to have much influence with European statesmen. In 1805 he fitted out a ship, the *Leander*, and in 1806 set sail for the Caribbean in the hope of founding an independent state to be called Colombia. But he failed to gain expected support from Jefferson who, having just purchased the Louisiana Ter., had no mind to quarrel with Spain. When the *Leander* and its crew of filibusters reached Venezuela M. found the coastguards ready with cannon to resist him and he was obliged to sail away, baffled in his dreams of throwing off the Sp. yoke from his native land. He returned to London, this time to discuss his plan of warring against Spain in America with Sir Arthur Wellesley, but to no purpose. He also discussed the problems of America with Bentham and received the delegates of Caracas, who had come to England to seek support. Among them was Simón Bolívar, then twenty-seven years old. M. later sailed to Caracas, where he was met by Bolívar, but the nation did not put its destiny unreservedly into his hands. When war broke out in Venezuela, however, M. marched at the head of the troops, a motley ill-trained mob of patriots, who met with decisive defeat at Puerto Cabello, M. being forced to sign a treaty yielding the country to the Sp. royalists (1812). Bolívar turned against him and advised handing him over to the victorious Spaniards, and M. spent six months in the prison of La Guayra and was finally taken to Cádiz, where he d. after more than three years' incarceration in the Caraca prison. Even if he failed in his life's purpose, he was the intellectual father of the revolution which was eventually undertaken successfully by Bolívar. See J. Biggs, *History of Miranda's Attempt to effect a Revolution in S. America, 1809*; C. Dumouriez, *Mémoires*, 1822; R. Beccaria, *Vida de Don Francisco Miranda*, 1896; W. S. Robertson, *Francisco de Miranda and the Revolutionizing of Spanish America*, 1908, and *The Life of Miranda*, 1930; *Archivo del General Miranda* (Caracas) (15 vols.), 1929-38; and J. N. Sardi, *Aventura y tragedia de Don Francisco Miranda*, 1935.

Miranda, maritime state of N. Venezuela. Coffee is extensively grown. Cap. Los Teques. Area 3868 sq. m. Pop. 227,600.

Mirandola, Giovanni Pico, Count Della, see PICO DELLA MIRANDOLA.

Mirbeau, Octave Henri Marie (1850-1917), Fr. novelist and playwright, b. at Trévières (Calvados). He was first a journalist; his first novel was *Jean Marcket* (1881). Other tales: *Le Carnaire* (1886); *La Famille Carmelites* (1888); *L'Abbé Jules* (1888); *Les Vingt-et-un Jours d'un neurotchéique* (1901); *Dans l'Antichambre* (1905); *Dingo* (1912). Plays, *Les Mauvais Bergers* (depicting the struggle between capital and labour, 1897); *Les Affaires sont les affaires* (a vigorous social play and one of the best plays of its time, 1903). See life by M. Renon, 1924.

Mircea (1386-1418), voivode or prince of Wallachia, styled himself 'count' of Severin, despot of the Dobrudja and lord of Silistra, and was also master of Sistova and Vidin. As an ally of Sigismund of Hungary, his former rival, he was defeated in 1396 by the Turkish sultan, Bayazid I., but the following year he gained a victory over Bayazid at Craiova. In 1416 he lost Silistra to Sultan Mohammed I., and had to acknowledge Ottoman dominion.

Mirecourt, tn. in the dept. of Vosges, France, on the R. Madon, 27 m. S. of Nancy. Pop. 5200.

Mirfield, par. and tn. of W. Riding of Yorkshire, England, on the R. Calder, 4½ m. N.E. of Huddersfield. There are collieries and malting works near, and the chief munificents are blankets, carpets, and cloth. There is an Anglican Theological College at M., its full name being the Community of the Resurrection. It was founded in 1892 at Pusey House by Charles Gore and moved eventually to M. in 1898. There are branches in Johannesburg and London. Pop. 13,000.

Miri, seaport of Sarawak, Brit. N. Borneo, 30 m. N.W. of Chaudetown. The area is an important oilfield, and there are exports of petroleum.

Miro, Joan (b. 1893), Sp. painter, b. at Montroig, associated in Paris with Salvador Dali as a leader in the school of surrealist painting.

Miropolje, or **Mirolye**, tn. in the Kursk Region of the R.S.F.S.R., on the Psiol R., 82 m. N.N.W. of Kharkoff, and 83 m. S.W. of Kursk, probably founded in the seventeenth century as a stronghold against Tartar incursions. It is an agric. centre and there are boot factories. Pop. 11,000.

Mirror (Fr. *miroir*) optical instrument of glass or metal, having a polished surface to reflect images. The use of Ms. is very ancient; they were known in the Early Iron Age, being then mostly thin plates of polished metal. Under the Caesars silver Ms. were common. The back of the M. was often handsomely adorned with chasing or repoussé. In the Middle Ages steel, silver, and glass Ms. were much used, the glass being backed with metal, especially lead. Modern silvered Ms. were first known as *Venitians*, having been first made on a large scale at Murano. Their manuf. was first introduced into England in the seventeenth century.

Mirs Bay, opening on the S. coast of China, E. of Hong Kong. Length 140 m., breadth 60 m. Great Britain leased the S. shore in 1898 for ninety-nine years.

Mir Turab Ali, see **SALAR JUNG, SIR**.

Mirza, contraction of the Persian 'Emir Zadah' (son of the prince), the usual title for scholars and officials, when it precedes the surname, and 'prince' when it follows it.

Mirzapur, tn. and dist. of the United Provs., India, on the r. b. of the Ganges, 30 m. from Benares. The dist. is traversed from E. to W. by the Vindhya and Kalmur ranges which are connected by a jungly central plateau. The tn. is noted for its carpets and rugs. Until

comparatively recent years it was the chief mart in Upper India for cotton and grain, but its commercial importance declined owing to the estab. of railway communication with Bombay via Jubalpore, and the development of Cawnpore as a mercantile centre. Other manufs. are shellac and metallic wares. Pop. 900,000 (tn. 70,000).

Misamis, prov. of the N. coast of Mindanao, Philippine Is., including Camiguin Is. Its irregular coastline contains Iligan Bay. There is much nat. and forest land. Rice, abaca, cacao, sugar, and cotton are produced. The tn. of the same name in N.W. Mindanao is 55 m. from Cagayan. Gold, sulphur, copper, and coal are found near. Pop. of prov. 130,000 (tn., 7000).

Misappropriation. The M. of property by any person who has been entrusted (solely or jointly with another) with or has received such property either for safe custody, or that he may apply, pay, or deliver the property or its proceeds for a particular purpose, or to a particular person, is a misdemeanour, punishable with penal servitude up to seven years (Larceny Act, 1901, replacing analogous sections in the Act of 1861). Bankers, merchants, brokers, and others guilty of M. are affected by this Act, while M. by trustees on an exec., trust created by deed or will, or by mortgages, or by factors, or agents generally, is similarly punishable under the Larceny Act of 1861 (*see also LARCENY*). It is difficult to see on what principle M. by the above kinds of bailees should be only a misdemeanour, while embezzlement by clerks or servants, i.e. persons usually much lower in the social scale, should be a felony, punishable with penal servitude up to fourteen years. See EMBEZZLEMENT.

Miscarriage, *see ABORTION*.

Misdemeanour, *see CRIMINAL LAW*.

Miseno Capo (ancet. Misenum Promontorium), promontory of S. Italy, at the N.W. extremity of the gulf of Naples, 9 m. from Naples. The ruins of the ancet. Rom. port are near by. Under Augustus it was an important naval station. The Saracens destroyed the old tn. in A.D. 890.

Miserere: 1. Name under which Psalm II. (Vulg. I.) is commonly known. Four psalms commence with the words *M. mei Deus*, but the pre-eminence of this psalm has led to the name being appropriated to it. M. is the greatest of the penitential psalms, and tradition states that it was called forth by the prophet Nathan's announcement to David of his sin. 2. Inaccurate form often found for *misericordia*, a word derived from Lat. *misericordia*, pity, and so applied to various relaxations of strict monastic rule. It is best known as the designation of a small ledge under the seats in the choir, which, when the seat was turned up, formed a projection on which the monk could rest when standing.

Misericordia, or *Brethren of Mercy*, most famous of the confraternities formed in Florence in 1240 for the seemly burial of the destitute. During the plague of 1348-49 they performed valuable work.

The members, when on duty, wear a dress covering all but the eyes.

Mishawaka, tn. of Indiana, U.S.A., in St. Joseph co., on St. Joseph R., 72 m. S.E. of Chicago, with manufs. of agric. implements, machinery, and paper pulp. Pop. 28,200.

Mishna, traditional commentary on the written Heb. law, handed down orally until about the beginning of the third century A.D., when it was finally committed to writing. The M. consists chiefly of the discussions of rabbis between the year 70 and the time of writing. After 200 still further discussions on the law and the M. went on in the schools both of Babylon and of Palestine. These further discussions constitute the Gemara, which, with the M., forms the Talmud. See JEWS.

Misiones, ter. in the N.E. Argentine Republic, with the Paraná R. separating it from Paraguay (N.W.), and the Uruguay R. separating it from Brazil (S.E.). There are tracts of forest and pasture land. Timber, *yerba mate* (Paraguay tea), wheat, tobacco, and sugar are produced, and cattle are raised. Posadas (pop. 20,000) is the chief tn. Area about 11,750 sq. m. Pop. 244,100.

Misiones, Las, name of a dept. in Paraguay; cap. San Juan Bautista. Pop. 46,700.

Miskolc, tn. of Hungary in the prov. of Borsod in the valley of the Sziava, 24 m. N.E. of Erlau. The manufs. include boots and shoes, porcelain, leather, snuff, etc., and in the vicinity are stone quarries and iron mines. There are large gov. iron and steel works at Diosgyor 5 m. to the W. Pop. 73,300.

Mispickel, obsolete name for the mineral *Arsenopyrite*, from which arsenic is prepared by roasting, air being excluded; it is crystalline, orthorhombic, steel-grey, and hard; chemically, FeSAs. M. is chiefly obtained commercially from U.S.A. and Germany.

Mispriision (literally, neglect or contempt) means concealment of a crime in the sense of keeping one's knowledge of its commission to oneself without participation in it either as prin. or accessory. M. of treason was formerly, but is not now, regarded as equivalent to the full offence. See CRIMINAL LAW.

Misrepresentation. In the law of contract a M. or false statement of some matter relating to the contract is ground for upsetting the contract if the M. was made before or at the time of entering into the contract. M. may be (I.) fraudulent, or (II.) innocent. A M. to be fraudulent must amount to a misstatement of a material fact and not a mere expression of opinion; the person making it must have known it to be false, or have made it either without believing it to be true, or recklessly, without caring whether it were true or false; it must have been intended by the maker that the other party should act upon it; it must actually have deceived the other party; and finally, the other must actually have suffered damage by it. If all these conditions are fulfilled the defrauded party may either (1) sue

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for rescission of the contract with or without claiming damages, or (2) adopt the contract and sue for damages, or (3) resist any action to enforce it and counter-claim for a declaration that the contract is void. If he elects to sue for rescission, he must do so within a reasonable time, so as not to involve loss to innocent third parties. The old common law gave no remedy for innocent M., but now all courts, conformably with equitable doctrines, will rescind a contract at the instance of a party who has been induced to enter into it by reason of a false though innocently made statement in a material particular; but the injured party is not entitled to claim damages, except: (1) For false statements in a company prospectus. But it is a good defence that the maker had good ground for believing his statement to be true. (2) Against an agent who holds himself out as being authorised to contract for another when he is not.

Misrule, Abbot or Lord of, see LORD OF MISRULE; REVELS, MASTER OF THE.

Missal, book containing all the prayers and official ritual required for the due celebration of mass throughout the year. The text of the mass consists of an invariable framework known as the Ordinary, and a large number of prayers, etc., which change throughout the year. Formerly these variable portions were found in separate vols., such as the *Antiphonarium*, *Graduale*, *Epistolarium*, etc. The process of combining them into one vol. became general before A.D. 1000, probably arising about 900. At the Reformation the Anglican Prayer Book, 1549, superseded the old Sarum M. The Rom. M. revised in 1884, is universal in W. Catholicism, save for the local Ambrosian, Mozarabic, and various monastic rites.

Missel Thrush, Mistletoe Thrush, or Holm Thrush (*Turdus viscivorus*), common bird throughout England and most European countries. The male is 11 in. long, and is the largest of Brit. thrushes and also of Brit. song-birds. Its colour is greyer than the song-thrush, and in flight a white tail feather is shown upon each thigh. The song is not so varied and melodious as that of the song-thrush. The eggs are bluish-white, spotted with purplish-brown. The food consists principally of berries (particularly those of the mistletoe) and insects. It is sometimes called the storm cock.

Missenden, Great, vil. of Buckinghamshire, England, 29 m. from London, and 9 m. from Aylesbury on the E. Region and Metropolitan railways. It is a popular residential place for Londoners, near it is the vil. of Little M.

Misi Dominici, the supreme court of the Frankish kings. The system of M. D. is believed to have been introduced by Charlemagne who appointed them to act as a court of appeal from the courts of the Crown vassals. Later, however, the great vassals sought to avoid recourse to the royal courts by setting up their own order as a parliament of the nation or, in effect, a house of peers. The M. D. were also sent round the kingdom in Charlemagne's

time in order to report on the state of the various dists., to investigate grievances, and to proclaim the emperor's decrees.

Missing Link, see DARWINISM; EVOLUTION; MAN.

Mission, foreign legation, or, collectively, the members of an embassy, as, e.g. the Brit. M. at Peking. Secretaries and attachés are not, as a rule, employed in the same M. or embassy for more than two years, subject to the foreign secretary deciding to extend the term for public reasons. The duration of the appointments of heads of Ms. at foreign courts may not exceed five years, at the end of which time the appointment is renewable by the foreign secretary, if desirable on public grounds. Members of Ms. retire at seventy years of age. The chief of a M. is styled in the Foreign Office regulations 'minister,' whether his official title be that of ambas., ministrer, or *charge d'affaires*.

Missions. The command given by Jesus to His disciples to preach the gospel throughout the world, baptising in the Triune Name, has been carried out by Christians in every age, though sometimes with but little vigour. During the first centuries the spread of the faith was exceedingly rapid. The Book of the Acts of the Apostles tells of the evangelisation of Asia Minor, and the introduction of the church into Europe. To the second century we may possibly assign the introduction of Christianity into England (Bede, *Historia Ecclesiastica*, cap. v.). N. Africa was early visited by missionaries, and during the early centuries the African church was one of the most vigorous and flourishing. The dates of the beginnings of missionary enterprise to the E. of Palestine are uncertain. By the third century there was a flourishing church in Persia and also in Armenia. During the fourth century Christianity continued to spread in Gaul, England, and Spain (all of which countries suffered under the persecution of Diocletian), and was introduced into Abyssinia and Switzerland. In the fifth century occurred the evangelisation of the Irish under St. Patrick, and of the Frankish peoples who had entered Gaul from beyond the Rhine. From Ireland missionaries passed to N. England and S. Scotland. This Celtic work is associated specially with the names of Columba, Aidan, and Cuthbert. But the A.-S. invaders reduced England to paganism again, and it was brought back to Christianity by Augustine and a band of monks, sent from Rome by Pope Gregory in 597. During the fifth and the three following centuries the Nestorian heretics were vigorous missionaries in the E. The eighth century was the time of the missionising of Germany by the Eng. monk, Winfrid or Boniface, and in the next century the faith was carried to the N. Scandinavian races by the monk Ansgar, the work being continued during the three following centuries among the Danes, Norwegians, Icelanders, Poles, Magyars, and the Slavs of E. Europe. By the eleventh century Russia was mainly converted by E. missionaries.

During the thirteenth and fourteenth centuries missionary enterprise slackened, though still carried on by the friars.

The discovery of a new continent opened fresh fields of vast extent for missionary enterprise. In the sixteenth century the work was mainly taken up by the Sp. Dominicans, Franciscans, and Jesuits. To the last named belonged the best known of the missionaries of this century, St. Francis Xavier, who preached throughout the E. from India to Japan. Thence the Jesuits made their way to China, where little progress was made till the time of Father Ricci (*q.v.*). In 1663 the Séminaire des Missions Étrangères was founded in Paris, and from Rom. Catholic missionary work was carried on mainly in the Indo-Chinese peninsula. Among the most successful M. may be mentioned that of the Jesuits in Paraguay (1582 1767) which has been praised by all historians, and that of the Franciscans in California in the eighteenth century. In 1822 the Association for the Propagation of the Faith was founded to supply money for the various religious orders and missionary societies. Among these may be mentioned S. Joseph's College of the Sacred Heart for Foreign M. founded in England by the exertions of Cardinal Vaughan, for the education of missionaries. There are too many orders for separate mention, but well known are the White Fathers founded for Africa by Cardinal Lavigerie, and the Medical Missionaries of Mary, an order of nuns with 100 convents spread out over Africa, Asia, and Australia. All Rom. Catholic missionary organisations come finally under the jurisdiction of the Sacred Congregation of Propaganda at the city of Rome until such time as a native hierarchy of bishops is estab. This is the aim of every mission field. A considerable degree of progress has been made in China, which now has a native Chinese cardinal, a hierarchy and a total communion of about 3,000,000. In India the number of converts is also large, but with the new independent commonwealth status acquired by India the future of the M. is a problem, since they are apt to be regarded as something introduced from the W. and alien to Hindu culture. Since the Second World War and the abandonment of divine claims by the Jap. emperor, great numbers of Jap. are seeking admission to Christianity, which seems likely to make great progress in that country after two and a half centuries of persecution. The total number of Christians in the Catholic M. (*i.e.* converts from pagan countries, or countries only evangelised since the Reformation) is upwards of 30,000,000.

The countries which broke away from the Rom. obedience at the time of the Reformation felt at first unable to undertake the charge of any M. The first government to take the work in hand was the council of Geneva, which in 1555 sent missionaries with a colony to Brazil on the advice of Coligny. But the colony was destroyed and the attempt failed. Little progress was made for over a century. In 1602 the Dutch E. India Company tried

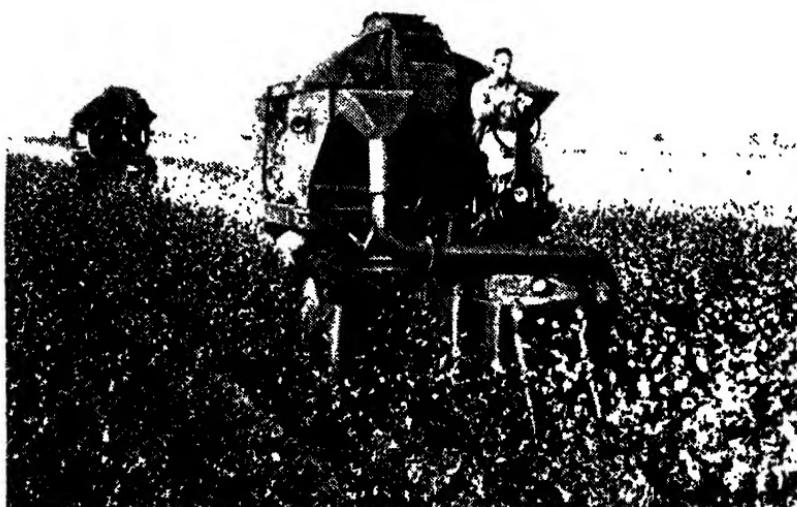
to christianise the natives of its colonies, but the conversions were mostly conversions in name only. The attempt, however, was attended with success in Java and the surrounding is., for here the Scriptures had been made available in a translation. The question of foreign M. received the consideration of the Eng. Parliament during the protectorate of Cromwell, and as a result the Corporation for the Propagation of the Gospel in New England was founded in 1649. With this corporation was connected the famous missionary John Eliot, the first to translate the Bible into a heathen language in modern times. His Indian Bible was publ. in 1683. The Society for Promoting Christian Knowledge was founded within the Church of England in 1698, and since that date the scope of its activities has been ever widening. The work of the S.P.C.K. was supplemented in 1701 by the foundation of the Society for the Propagation of the Gospel in Foreign Parts.

In 1732 the Moravian Brethren sent out their first missionaries to St. Thomas in the W. Indies. They have now stations in Greenland, N. and S. America, S. Africa, Australia, and Tibet. The Baptist Missionary Society was founded in 1792 and Carew and Thomas were sent as its first representatives to India. The London Missionary Society was founded in 1795 and is now almost entirely in the hands of the Congregationalists. The first work undertaken by the L.M.S. was in the South Seas, and it has since extended to S. Africa, India, China, Madagascar, and New Guinea. In 1797 was founded the Church Missionary Society, which took its present name in 1812. The C.M.S. represents the Evangelical party in the Church, while the S.P.C.K. lays more stress on the Catholic aspect of Anglicanism. It is the greatest of the Church of England societies, with an income of nearly £500,000. Connected with it is the Church of England Zenana Missionary Society, founded in 1880. Other prominent Church of England M. are the Melanesian Mission, founded in 1841 by Bishop Selwyn in New Zealand; the Unive. Mission to Central Africa, founded in 1859, the Wesleyan Missionary Society, founded in 1817 in the W. Indies, which has worked with great success in Australia and Africa, and had a pre-war ann. income of about £500,000. Presbyterian missionary societies were founded by the Irish in 1840 and by the Eng. in 1817. The former have missionaries in India, the latter in China. All the Presbyterian M. are carried on by the churches as such and not by separate societies. The Friends' Foreign Missionary Society, organised in 1807, operates chiefly in Madagascar, but works also in India, Ceylon, Syria, and China; the name has recently been changed to the Friends' Service Council. The greatest of the undenominational M. is the China Inland Mission, founded by J. Hudson Taylor in 1865; connected with it is the Bible Christian Foreign Mission. The chief of the American M. societies are the Board of Commissioners for Foreign M., and the

societies of Baptist, Methodist and Presbyterian denominations. To all Protestant M. the Bible societies (especially the Brit. and Foreign Bible Society, 1804) are a most valuable auxiliary.

After the Edinburgh Conference (1910), the prin. M. societies, with the exception of the Rom. Catholics, adopted a plan of co-operative work. This produced such satisfactory results that, after the First World War, it became an international movement taking in mission societies of America and other countries. Moreover missionary work has changed in character;

and M. in general, see R. Lovell, *History of the London Missionary Society*, 1899; M. G. Guinness, *Story of China Inland Mission*, 1900; G. Warneck, *Outline of a History of Protestant Missions*, 1906; J. Richter, *Allgemeine evangelische Missionsgeschichte*, 1906-32; H. H. Montgomery, *Mankind and the Church*, 1907; E. M. Bliss, *The Missionary Enterprise*, 1908; G. A. Gollock, *Story of the Church Missionary Society*, 1909; W. A. Tatchell, *Medical Missions in China*, 1909; A. Beer, *Foreign Missions, what they have done and how they may be extended*, 1909; A. Schweitzer, *On*



United States Information Service: American Embassy

MECHANICAL COTTON PICKING IN MISSISSIPPI

Two mechanical cotton pickers at work on a plantation in Mississippi. These cotton-picking machines are estimated to be capable of doing the work of fifty to eighty hand labourers.

instead of being essentially an overture of the people of one country to those of another, with consequent emphasis on differences of nationality, efforts are now directed chiefly to the development of indigenous churches, which, though continuing to receive assistance from Europe and America, have become as far as possible self-governed. A similar tendency to aim at self-government is discernible in the Rom. Catholic M. Statistics, which however should be treated with caution, may be found in *World Missionary Atlas* (2nd ed., 1925) for Protestant M., and *Little Atlas of Catholic Missions*, 1925, for Rom. Catholic M.*

See for Rom. Catholic M.: M. R. A. Henrion, *Histoire générale des missions catholiques*, 1846-47; Durand, *Missions catholiques françaises*, 1874; and the pubs. of the Propaganda. For Protestant M.

the Edge of the Primordial Forest, 1922, and *From my African Notebook*, 1939; K. MacLennan, *Twenty Years of Missionary Co-operation*, 1927; J. Foster, *Chinese Realities*, 1928; F. D. Walker, *India and her Peoples*, 1928; K. L. Latourette, *History of the Expansion of Christianity* (7 vols.), 1917; C. P. Groves, *The Planting of Christianity in Africa*, 1948; A. B. Lloyd, *A Life's Thrills*, 1949; and *International Review of Missions*.

Mississippi, the Magnolia State, S. central state of the U.S.A., bounded on the N. by Tennessee, on the S. by the gulf of Mexico and Louisiana, on the E. by Alabama, and on the W. by the R. M. The general surface is low with a trend towards the S. and S.W. A few m. from the shore is a chain of low, sandy is., which forms the bay of St. Louis on the W. and Pascagoula Sound on the E. The delta

region and the littoral generally is sandy and unhealthy, but there are immense cotton, rice, and tobacco crops in the lowlands by the M. R. and its sluggish trib., the Yazoo. Farther N., on the uplands and bluffs, pine, oak, walnut, and magnolia trees abound, but in the S. and sandy S. dists., pine trees alone are plentiful. In fact one-third of the state is forest, chiefly yellow pine. The chief rvs. are the M., the Yazoo, the Big Black, the Pearl, and the Pascagoula. The climate is nearly subtropical, though frosts occur in severe winters even in the S., and fevers are frequent in the bottom lands. The soil is, on the whole, extremely fertile, and agriculture is a very important industry; the state is the third cotton-growing state in the Union after Texas and Arkansas. Indian corn, rice, wheat, rye, and oats are also grown in large quantities, and the sugar-cane is cultivated in the S. part of the state. The prin. vegetable is the sweet potato, but the common potato, peas, and beans, and most of the vegetables known to European countries, are also grown. Plums, peaches, figs, and oranges are abundant. Manufs. now equal in value the agric. products, and among the chief are lumber and timber, turpentine and resin, cotton-seed oil and cake, cotton goods, and fertilisers.

More than half the church-going inhab. of M. are Baptists (Negro Baptists with 322,000, and S. Baptists 150,000). M. was settled in 1716, and ceded by the Fr. to Great Britain in 1763; in 1798 it was organised as the ter. of the M. In 1817 the ter. of Alabama was organised from the M. ter., and in the same year M. was admitted to the Union. There is a Senate of forty-nine members, and a House of Representatives of 140. M. sends two senators and seven representatives to Congress. Area 47,716 sq. m. Pop. 2,092,000, of whom 49 per cent are Negroes. Chief cities: Jackson (cap.), 62,100; Meridian, 35,500; Vicksburg, 24,500. See pub. of the M. Historical Society (19 vols.); *Encyclopaedia of Mississippi History, 1510-1907*, 1907; D. Rowland, *History of Mississippi*, 1925; and Federal Writers' Project, *Mississippi: a Guide to the Magnolia State*, 1938.

Mississippi River, most important riv. of N. America, rises in the state of Minnesota in the basin of Lake Itasca, and flows into the gulf of Mexico. It is, with the Missouri, its chief trib., the longest riv. in the world (1221 m.), and drains an area of about 1,250,000 sq. m. Altogether the M. has forty-two trib. streams, and the navigable mileage is 12,798. Its chief trib.s are on the E., the Wisconsin, Illinois, Ohio, Yazoo; and on the W. the Minnesota, Des Moines, Missouri, St. Francis, White, Arkansas, and Red Rvs. It is still important commercially, although a good deal of its traffic has been diverted to the railways, and has on its banks many important tns.: St. Paul, La Crosse, Prairie du Chien, Dubuque, Muscatine, Burlington, Quincy, and Hannibal on the upper riv., i.e. the M. from the source to the mouth of the Missouri; and St. Louis, Cairo, Memphis, Vicksburg, Natchez,

Baton-Rouge, and New Orleans on the main riv. A great disadvantage and drawback generally is the frequent occurrence of floods. Great damage was done by floods in 1927 and, ten years later, almost the worst floods in the hist. of the continent occurred through the overflowing of the M. and the Ohio. A million persons were made homeless, and the entire pop. of the M. valley between Cairo and New Orleans had to be evacuated. But the floods of 1917 broke every flood record since 1844. All that could be done was to reinforce the dykes with sandbags, but sev. dykes were broken and thousands of farmers had to take to the hills. The dykes are designed to keep the M. about 1 m. wide. Many of them were built by the Federal Gov. in 1936 as part of the New Deal (q.v.); but there are some sections protected by smaller, weaker dykes, which were built earlier by the local communities, and it was these that gave trouble in 1947, many of them having failed, either through not being high enough, or through breaking in some weak section. Over 100,000 ac. were flooded, and the damage was estimated at more than £3,000,000.

The actual discovery of the M. was made by a Fr. missionary, Jacques Marquette, about 130 years after an abortive attempt by Hernando de Soto. The comte de Frontenac, then governing in Canada in the name of Louis XIV., sent out Marquette to ascertain whether the riv. really existed. Early in 1673 Marquette, with a few men, proceeded westward from Quebec along the Great Lakes, made his way S.W. and S., and discovered the M. on May 17, 1673. On his return to Quebec Frontenac proposed that the riv. be given the name of Colbert, in tribute to Louis's great minister. Robert Cavelier de La Salle (q.v.) sought permission of Frontenac to undertake the conquest of the riv. and its region. Frontenac, deeming La Salle's plans to be beyond the purview of a governor of Canada, sent La Salle to France to discuss them with the king, who sent him back to Canada with full authorisation to carry out the expedition. With Father Marquette and an It. named Tonti (remembered in relation to the 'tontine' plan of life insurance by groups) and a party of twenty-three Frenchmen, twenty Indians, and ten Indian women, La Salle travelled across the lakes and began the descent of the riv. The party reached the point where, in the sixteenth century, Hernando de Soto had abandoned the attempt to discover the riv. Eventually the party reached the gulf of Mexico. La Salle took possession of the riv., and a notary drew up a legal record of the act, referring to the riv. as the Colbert. Back in France La Salle was honoured by the king, and a second expedition was fitted out. On the return trip, however, La Salle tried to enter through the gulf of Mexico, but was unable to find the riv.'s mouth. The captain of the fleet, growing impatient, sailed away without its leader. La Salle advanced into Texas, a small group accompanying him, and there he fell victim to an assassin's dagger. It

was the destiny of the three discoverers, de Soto, Marquette, and La Salle, to die obscure deaths just as they had the prize within their grasp. Thenceforward came the struggle to see who should carry out the conquest, but one of the earliest incidents in the hist. of the riv. subsequent to its discovery was the foundation of New Orleans by Jean Baptiste Lemoine, sieur de Bienville (*q.v.*), c. 1718. See also LOUISIANA. See further under FLOODS AND INUNDATIONS.

Mississippi Scheme, or Mississippi Bubble. financial scheme projected by John Law at Paris in 1715 for the colonisation and cultivation of the banks of the M. Shares were issued which rapidly rose in value owing to the report that there were gold and silver mines in those parts; and the company, which assumed the title of the Compagnie des Indes, undertook the management of the mint, and farmed the revenue from the gov., so that not only did the company control practically the whole colonial trade, but it had in its hands the management of the currency and the finance of France. By 1719 shares were selling at forty times their face value, and in 1720 Law made an attempt to amalgamate the company and the Banque Royale. Then came the crisis, people began to lose confidence, and a run was made on the bank, which eventually stopped payment. Law escaped from France in Dec. of the same year. See H. Montgomery Hyde, *The Amazing Story of John Law*, 1948.

missive. Scots law, denotes documents the interchange of which between parties is effectual to conclude a binding sale or lease. A M., unless holograph (*q.v.*), must be witnessed and authenticated as a probative deed; if holograph, the acceptor prefixes in his own handwriting a copy of the offer made by the other party. No action can be brought on an unstamped M. Radical defects in a M. cannot be cured by oath.

Misalonghi, or Mesolonghi, fortified tn. on the Gk. coast, in the prov. of Acarnania and Aetolia, situated in a marshy plain, covered with olive plantations, N. of the gulf of Patras. It is famous for having sustained three sieges by the Turks, in 1821, 1823, and 1825-26. Lord Byron d. here on April 19, 1824, and a monument was erected in his honour. Currants and valonia are exported. Pop. 9700.

Missoula, city of Montana, U.S.A., co. seat of Missoula co., on Clark Fork, Columbia R., 90 m. N.W. of Butte City. It is the seat of the Montana Univ. Lumber milling is carried on, and there are railway workshops. Pop. 18,450.

Missouri, central state of the U.S.A., lying midway between the Atlantic and the Rockies. It has an area of 69,770 sq. m. The Mississippi flows along its E. border. E. and W. the state is traversed by the M. R., into which flow the Grand, Chariton, Osage, and Gasconade. The St. Francis and Big Black are affluents of the Mississippi. The M. flows into the Mississippi above St. Louis. Northward of the M. are rolling prairies and forest lands, whilst to the S. is a region of

plateau, known as the Ozark Mts., and also much marshy and cultivated ter. The chief industry is agriculture; maize being the prin. crop; oats, wheat, potatoes, fruits, and cotton are also grown. Cattle rearing is important. M. is rich in minerals. Coal is produced over an area of 14,000 sq. m., especially in Bates, Lafayette, and Ray cos., and the outputs of zinc and lead are more than twice as valuable as that of coal. Limestone, Portland cement, hematite, iron, etc., are also produced. Meat-packing is the most valuable industry, and manufus. include boots and shoes.

M. was first settled in 1764, made into a ter. in 1812, and admitted to the Union in 1821. The General Assembly comprises thirty-four senators and 154 representatives; two senators and thirteen representatives are sent to Congress. The chief religious bodies are Catholic (440,000); S. Baptist (284,980); S. Methodist (209,890); and Disciples of Christ (129,420). Its chief colleges are the State Univ. at Columbia and St. Louis Univ. and Washington Univ., both at St. Louis. The largest cities are St. Louis (816,000); Kansas City (399,200); St. Joseph (75,700) Springfield (61,200); Joplin (37,100); and Univ. City (33,000). Jackson (24,300) is the cap. See W. B. Stevens, *Centennial History of Missouri* (4 vols.), 1921; P. S. Radley, *History of Missouri*, 1927; W. Williams and L. C. Shoemaker, *Missouri* (5 vols.), 1930; and Federal Writers' Project, *Missouri: a Guide to the 'Show Me' State*, 1941.

Missouri ('Big Muddy') River, largest trib. of the Mississippi, is 3017 m. long and 3000 ft. broad at its mouth. Rising among the Rockies in Wyoming and Montana, it passes northward through a wild gorge flanked with precipitous cliffs and known as 'the Gate of the Mountains.' Some 110 m. below this gorge and 40 m. above Fort Benton are the four Great Falls, the grandest of which is a sheer cataract of 87 ft. The M. is formed by the junction of the Madison, Jefferson, and Gallatin Rs., which all rise in the Rocky Mts., and unite at Gallatin City in Montana. After receiving the Milk and the Yellowstone (1152 m.) Rs., it flows S.E. through the Dakotas as far as Sioux City. It now separates Nebraska and Kansas on the W. and Iowa and Missouri on the E., and after traversing M. enters its main stream 20 m. above St. Louis. Other large trib. are the Platte and Kansas. The riv. is navigable almost to the Great Falls (that is, within 2285 m. of the mouth).

Missouri Compromise. In 1817 the inhab. of the Missouri ter. petitioned for admission into the Union as a state; subsequently a Bill was introduced into Congress on Feb. 13, 1819. A question of the abolition of slavery in the ter. caused the Bill to be delayed until a compromise was agreed to, March 2, 1820; this, however, still led to much discussion, and it was not until Feb. 27, 1821, that a final compromise was adopted, which led to the admission of Missouri to the Union as a state. The Act of 1821 enacted that in all the

ter ceded by France, known as Louisiana, N. of lat. 30° 30' N., excepting Missouri, slavery should be for ever prohibited, and on this concession by the pro-slavery party in Congress, Missouri was admitted as a slave state. The Act was abrogated by the passage of the Kansas-Nebraska Bill of 1854.

Mist, see Fog.

Mistake. As a general rule one party to a contract cannot escape liability to perform his part of it on the ground that he understood its terms in a different sense from that in which any reasonable person would have understood them. But if a mutual, as distinct from a merely unilateral, M. is proved to the satisfaction of the court, the contract may be set aside. On the other hand, unilateral error will afford ground for rescission if mistaken belief as to the real meaning of the agreement was induced by the conduct, innocent or otherwise, of the other party. If the offer and acceptance essential to the formation of a contract never agreed in terms, there never was a contract at all, not because either party has made a M., but because there was a want of mutuality. The net result is the same, however, as in the case of a genuine mutual M. Mutual error of intention (as distinct from error in expressing that intention, which, though ground for rectification, is not ground for upsetting a contract) practically arises only where parties contract for or about a thing which has never had, or has ceased to have, any existence, or are mistaken as to the identity of the particular thing about which they are contracting, or as to the identity of one another. A M. due to ignorance of a general rule or law, as distinct from ignorance of a particular right, affords no ground for relief. Where M. does excuse, the remedy of the mistaken party, where the contract (q.r.) is still executory, is to sue for a declaration that the contract be rescinded and any money paid under it refunded to him. Sometimes, in the case of unilateral error, the court will decree rectification of the terms instead where the mistaken party is willing to take such relief.

Mistassini, lake of Quebec, Canada, 120 m. in length and 20 m. in width. It drains into James Bay by Rupert R. The Little M. lake stretches parallel on the E. side of the greater lake.

Misti Mountain, Peru. see EL MISTI.

Mistletoe, or *Viscum album*, a shrubby evergreen (family Loranthaceæ), parasitic on a large variety of fruit and forest trees, but principally on the apple. The berries are white, with single seed invested by a glutinous pulp. The berries are eaten by birds, and the seeds become attached to the branches of trees by the agency of birds; and on germination the embryo pierces the bark and penetrates to the wood. Of its hosts the chief in Britain are black poplar and apple. M. may be easily established on a tree by rubbing the berries when ripe (at the end of Feb.) upon the under side of young, healthy branches. Growth is very slow at first, and male and female shrubs are produced separately; the former, of course, bear no berries.

The M. was revered by the Druids, figures much in European folklore, and is a feature of Christmas celebrations.

Mistletoe Thrush, see MISSEL THRUSH.

Mis Tor, Great and Little, are two hills of Devonshire, England, in Dartmoor forest, 16 m. E.S.E. of Launceston. The former reaches a height of 1767 ft., and the latter 1600 ft.

Mistra, city founded by the crusaders, a few miles from Sparta. It is a forsaken Byzantine tn., and was once the cap. of the Peloponnese. It was founded in the beginning of the thirteenth century by a Frankish prince, Guillaume de Villehardouin, on the spur of Mt. Taygetus for his stronghold and citadel. Half a century later it passed into Gk. hands. For nearly 200 years it was to be the cap. of the Byzantine prov. of the Morea (or Peloponnese) or, in fact, of Greece. A fortified city grew up, with splendid churches under the sheltering castle, a wealthy centre of European and Christian culture. In the fifteenth century Greece fell to the Ottoman Turks, but M. survived as a somewhat important place; and when the Eng. traveller Leake visited it over a century ago he found it still apparently well-to-do, with an export trade in silk and oil. But in 1834, after the war of Independence, M. declined into a dead city. To-day its chief buildings are the church of St. Demetrius and the monastery of the Pantanassa.

Mistral, Frederic Joseph Etienne (1830-1914), Provençal poet, son of a farmer in the Bouches du Rhône. On leaving school, M. tried farming, then law, and finally devoted himself to literature. In 1859 he, Roumanille, Mathieu, and others, founded the Félibrige, an association for the cultivation of Provençal literature. Among the most noteworthy of M.'s numerous works are *Mireille* (1859), a rustic tragedy; *Calendau* (1867), a mixture of legend and allegory; *Lis Iselo d'Or* (1876), a vol. of poems; his Rhône epic, *Lou Pouèmò dou Rouse* (1897); and *Lou Tresor des Félibrige* (1878-86), a collection of proverbs and folklore. In 1904 M. received one of the Nobel literary awards. See C. A. Downer, *Mistral, 1901*; and E. Lefèvre, *Bibliographie Mistralienne* (1903).

Mistral, Gabriela (pseudonym of Lucila Godoy y Alcayaga) (b. 1889), Chilean author and educationist, b. at Vieña, in N. Chile, dedicated herself to teaching, and became director of the elementary school at Magallanes. Later appointed to the consular service, she represented Chile in Madrid and Lisbon, and is now (1949) consul at Rio de Janeiro. She acted as Chilean delegate to the dept. of intellectual co-operation of the League of Nations. Her literary reputation outside her own country was made in 1922, with the pub. by the Historical Institute of New York of a collection of prose and verse entitled *Desolación*. Awarded the Nobel prize for literature for 1945.

Mistral, strong, chilly wind blowing from the N. down the Rhone valley. 'Le Parlement, le Mistral et la Durance sont les trois fleaux de la Provence.' Related

to the *bora* (see BOREAS) and *tramontana*, all winds blowing from the cold mt. regions N. of the Mediterranean, often as the rear winds of a cyclone, and somewhat like the Eng. north-easters. It is dangerous to fishermen and destructive to fruit blossom.

Mitau, or **Mitava**, see JELGAVA.

Mitcham, auct. Surrey vil. and urban dist. situated on the Wandle. Its prin. feature is the common, which has an area of some 480 ac. Market gardening was formerly the prin. local industry, rhubarb, mint, liquorice, and other medicinal plants being a speciality. It has an excellent golf course and cricket club, and still maintains its ann. fair in August. Pop. 54,000.

Mitchel, John (1815-75), Irish Nationalist, b. near Dungiven, co. Londonderry. He abandoned his practice of solicitor for a place on the staff of the *Nation*. In 1848 he issued the first number of the *United Irishman*, and having in its pages incited his fellow countrymen to rebellion, he was sentenced to transportation for fourteen years in Van Dieman's Land, from which he escaped to the U.S.A. Here he pub. *The Citizen*, *The Southern Citizen*, *The Irish Citizen*, etc., but his popularity waned when he showed himself an advocate of slavery, and in 1871 he returned to Ireland. He wrote *The Life and Times of Aodh O'Neill* (1846); *Jail Journal, or Five Years in British Prisons* (1854); and *The History of Ireland, from the Treaty of Limerick to the Present Time* (1868).

Mitchell, Donald Grant (1822-1908), Amer. author, b. in Connecticut, graduated at Yale in 1841. He wrote on gardening and agriculture, and on his travels in Europe and America. He also wrote some literary studies, Eng. and Amer., but his best work, under the pseudonym of Ick Marvel, was contained in *Rereries of a Bachelor* (1850), and *Dream Life* (1851).

Mitchell, Margaret Mannerlyn (Mrs. John R. Marsh) (1900-49), Amer. novelist, b. at Atlanta, U.S.A., only daughter of Eugene Muse M. Educated at the Washington Seminary at Atlanta, she completed her studies at Smith College, Massachusetts. From 1921 to 1926 she was a reporter and feature writer on the *Atlanta Journal* and retired after her marriage to Mr. John R. Marsh, a newspaper editor, in 1925. She wrote only one book, a novel of the Civil war, entitled *Gone with the Wind*, but it quickly became perhaps the most celebrated best-seller among the many successful modern Amer. novels. M. M. began the book in 1930 and completed it in 1936. It was the choice of the Book of the Month Club, which brought the sales in June 1936 to 75,000 copies; early reviews aroused even greater interest, so that 100,000 copies were sold before actual publication. During the first six months a million copies were sold, as many as 50,000 being sold sometimes in a single day. It was awarded the Pulitzer prize in 1937. Its sale, maintained over seven years, ran into 8,000,000. The story is said to have owed something of its

success to its title but more to the force of romantic conviction in the telling and the colourful background of slave-owning S. aristocrats. The two chief characters are Scarlett O'Hara, a hard, selfish, courageous young woman, whose faithful slaves are like lost souls when freedom comes to them, and the equally courageous smuggling adventurer, Rhett Butler, one of her lovers. But the real interest is not in the characters so much as in richness and variety of incident, which indeed disguises the fact that the story is but little concerned with the vital issues of the war. M. M. is recorded as saying that she began writing at the age of sixteen, and was deeply interested in the colonial hist. of the S. from childhood, having heard a number of war tales at an early age, all of which she had put into *Gone with the Wind*. She was a member of the Atlanta Historical Society and of the Huguenot Society of S. Carolina. In the lavish and highly emotional film adaptation of the novel, Vivien Leigh played the part of Scarlett O'Hara. M. M. was killed in a taxicab accident in Atlanta.

Mitchell, Sir Peter Chalmers (1864-1915), Brit. biologist and zoologist, b. at Dunfermline, Scotland, and educated at Aberdeen and Oxford Univs., and at Berlin and Leipzig. He was lecturer on biology at Charing Cross Hospital, 1892-1894; secretary to the Zoological Society of London, 1903-35; and examiner in zoology to the univ. of London, 1903. Publs. include *Outlines of Biology* (1891); *Biological Problems of To-day* (1896); *Thomas Henry Huxley* (1900); *The Nature of Man* (1903); *The Childhood of Animals* (1912); *Evolution and the War* (1915); *Centenary History of the Zoological Society of London* (1929); *Materialism and Vitalism in Biology* (1930), and various papers in the *Anatomical Journal*, *Quarterly Journal of Microscopical Science*, and *Proceedings of the Zoological Society*.

Mitchell, Reginald John (1895-1937), Eng. aircraft-designer, was b. at Stoke-on-Trent. After serving an apprenticeship with Kerr, Stuart & Company, of Stoke-on-Trent, he joined the Supermarine Company at the age of twenty-one in 1916, was appointed chief engineer and chief designer by 1920, and became a director of the company in 1927. In that year he was awarded the silver medal of the Royal Aeronautical Society in recognition of his share in the Brit. Schneider Cup victory at Venice. In the public mind his name will always be associated with the hist. of the Schneider trophy (q.v.), which, by virtue of the backing given to competing teams by their respective govts., became a grim technical competition with nations' prestige deeply involved. Not the least of his services to the country was the stimulus that these victories gave to Brit. aeronautical technique. How well he succeeded in combining superb aeronautical design with an adventurous but always sound structural technique is witnessed by the firm's record of service types. There have been the early Seagull, an amphibian of which many went into

southwest in Spain and Australia; the Southampton, long the standard twin-engined flying-boat in the Royal Air Force; followed quickly by the Scapa and the Stranraer; all bearing upon them the 'Mitchell' mark of originality, coupled with thoroughly sound execution. With the revival of the amphibian idea in the Seagull V., there became available for the Naval Air Service, under the naval name of Walrus, a new amphibian for use with the Fleet Air Arm. Of the machines last completed by M., the Spitfire (q.r.) a single-seater fighter, reflected more closely the immense knowledge gained in high-speed work in his Schneider trophy days. M. left a record of almost continuous achievement which has not been equalled by any other individual designer in the short hist. of aviation.

Mitchell, Silas Weir (1830–1911), Amer. novelist and physician, b. at Philadelphia. He wrote juvenile and historical fiction, but is chiefly famous for his books, *Wear and Tear, or Hints for the Overworked* (1871); *Rest in the Treatment of Disease* (1875); *Fat and Blood* (1877); and *Clinical Lessons on Nervous Diseases* (1895). See also WEIR MITCHELL TREATMENT.

Mitchell, Sir Thomas Livingstone (1792–1853), Scottish explorer, b. at Craigend, Stirlingshire. Appointed surveyor-general of New S. Wales in 1828, in four expeditions between 1831 and 1847, he did much to explore E. Australia ('Australia Felix') and tropical Australia, particularly the Murray, Glenelg, and Barcoo R.s. Pub. two vols. recounting his explorations, besides various technical works and a trans. of *The Lusiads* of Camoens.

Mitchell: 1. Co. seat of Davison co., S. Dakota, U.S.A., 65 m. N.W. of Yankton. Dakota Univ. (founded 1888, Methodist Episcopal) is situated here. There are machine and railroad shops, brick-yards, etc. Pop. 10,600. 2. Tn. of Perth co., Ontario, Canada, on the Thames R., 32 m. from London. It has numerous mills and factories. Pop. 2200. 3. Minor group of the Ellice Is., Pacific Ocean.

Mitchell. Amer. bomber, the B-25, a product of the N. Amer. company. A high-speed and heavily armed medium bomber, it was widely used both by the Amer. and Brit. air forces. Its two 17,000 h.p. engines gave a speed of 250 m.p.h.; the bomb-load was 3000 lb.

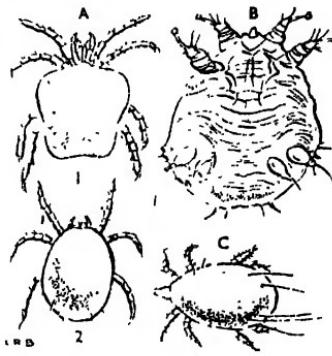
Mitchell Mount, highest mt. of the U.S.A. E. of the Rockies, is 6710 ft. high. It lies in the Black Mts., Yancey co., N. Carolina.

Mitchelstown, mkrkt. tn. of Cork co., Eire, 11 m. N. of Fermoy. It has a castle, and 7 m. away are M. caves, stalactitic caverns, in Tipperary co. It was the scene of a riot between Home Rulers and the police (Sept. 1887). Pop. 2000.

Mitchison, Naomi Margaret (b. 1897), Scottish novelist, b. in Edinburgh, daughter of Prof. J. B. S. Haldane, and educated at the Dragon School, Oxford. The best known of her novels are *The Corn King and the Spring Queen* (1931) and *The Blood of the Martyrs* (1930); like most of her stories, they deal with the anc. world.

Other pubs. include *Cloud Cuckoo Land* (1928); *The Laburnum Branch* (verse, 1928); *Barbarian Stories* (1929); *The Delicate Fire* (stories and poems, 1933); *The Fourth Pig* (1936); *Socrates* (with R. H. S. Crossman, 1937); *Moral Basis of Politics* (1938); and *The Hull Calves* (1947).

Mites, large number of small Arachnids comprising, with the ticks, the order Acarina. Many of them are parasitic on animals, and cause such well-known troubles as mange and sheep-scab. The harvest M. (*Microtrombidium autumnale*) is itself harmless, but in the larval stage, formerly called *Leptus autumnalis*, attacks man and animals, penetrating the thin skin, and setting up great irritation. *Dermanyssus gallinæ*, commonly called red M., is an abundant parasite on poultry, pigeons, and cage birds. Another M. (*Tetranychus telarius*), usually but wrongly



MITES

- A. (1) *Trombiculidium holosericum*, female, $\times 7\frac{1}{2}$
 (2) *Leptus autumnalis*—larva of *Trombiculidium*.
 B and C, *Sarcoptes scabiei*; B, female, C, young form.

called red (or money) spider, is a troublesome pest in greenhouses, extracting the juices of plants. A number of M. live in cheese, flour, and other foodstuffs. They are conveyed from place to place in the larval stage by attaching themselves to flies. Some M. live entirely in the water, and many are parasitic on insects. In the aggregate, they exhibit almost infinite variety of structure. See also ITCHMITE.

Mitford, John Freeman, see REDESDALE, BARON.

Mitford, Mary Russell (1787–1855), Eng. writer, b. at Alresford, Hampshire, daughter of a physician, without practice, selfish and extravagant, who squandered three fortunes, his own, his wife's, and his daughter's (£20,000 won in a lottery), and then lived on the industry of the last. Mary M. began her literary career by publishing a vol. of *Miscellaneous Poems* at the age of twenty-three. In 1823 Macready produced her tragedy *Julian*, at Covent Garden. Of her seq. plays the best was *Rienzi* (1828). Others were *The Foscari* (1826) and *Charles I.* (1828). In 1819 Miss M. began to print

in a forgotten periodical the series of sketches known as *Our Village*, which deservedly caught the public fancy, and were collected in book form in five vols. between 1824 and 1832. They are a series of sketches of village scenes and characters, thoroughly original and spontaneous, though Washington Irving was her literary model. In 1852 she brought out *Recollections of a Literary Life, or Books, Places, and People*, which contains



MARY RUSSELL MITFORD

much autobiographical matter. See A. G. L'Estrange (ed.), *Life and Letters*, 1870; and W. Roberts, *Mary Russell Mitford, her Life and Friendship*, 1913.

Mitford, William (1714–1827), Eng. historian, b. in London, studied at Queen's College, Oxford, and law at the Middle Temple. In 1771 he pub. *Inquiry into the Principles of Harmony in Languages*, followed by a *Treatise on the Military Force*. In 1784 appeared the first vol. of his *History of Greece*, completed in 1818 in five vols. M.'s *History of Greece* held its supremacy until Connop Thirlwall (q.v.) pub. his abler and less biased work on the same subject between 1835 and 1844. See T. B. Macaulay, *Review of Mitford's History of Greece*, 1824.

Mithraism, cult of Mithra, or Mithras, an anct. Aryan god of light, whom the Zoroastrians conceived of as a champion of Ahura-Mazda in his eternal conflict with Ahriman, the prince of evil. M. was therefore a spurious development of Mazdaism (see ZOROASTRIANISM) which latter spread over most of Asia Minor, but through Gk. influences, the only part of the creed which was embraced by the people was the worship of Mithra, really a subordinate, if attractive, Zoroastrian spirit, yet chosen as an absolutely supreme god. Mithra was early identified with the sun-god, and as such was the

centre of a cult which, according to Plutarch, was introduced to Rome by Pompey's pirate-captives from Cilicia in 68 B.C. The monuments of this worship have been found wherever the Rom. legions went in Britain, thus showing how readily one religion supplants another which has not adapted itself to the developing needs of any race. On the monuments of his cult Mithra is represented as a beautiful youth driving a sword into the neck of a prostrate bull which latter at the same time is being devoured by a scorpion, a crab, and a dog; but no convincing solution has been offered to explain this symbolic representation, which was no doubt part of an elaborate dogmatic system. M. was also an ethical system and what is extant of its ritual suggests the existence of an organised hierarchy and a worship assimilated to the Gk. mysteries. M. finally ceased to exist in the fourth century, when it was superseded by Christianity. In the struggle of Paganism with Christianity, however, M. exercised a powerful attraction, being a pure and elevated religion, and though at first a form of sun-worship, it became modified by syncretism. Its most striking ceremony was the blood-baptism called Taurobolium. See F. Cumont, *Textes et monuments figurés relatifs aux mystères de Mithré*, 1896–99; and A. Schütze, *Mithramysterien und Urchristentum*, 1937.

Mithridates, more properly **Mithradates**, being derived from Mithras, the sun-god: the name of sev. kings of Pontus, the best known being M. VI., surnamed Empator or the Great (b. c. 132, reigned 120–63 B.C.), and celebrated for his wars against the Rom. The first Mithridatic war lasted from 88 to 84 B.C. M. drove Ariobarzanes out of Cappadocia (of which he was king) and Nicomedes out of his realm of Bithynia, and at length made himself master of the Rom. prov. of Asia (see ROMAN HISTORY), massacring some 80,000 Rom. and It. citizens there. Sulla then crossed over into Greece and defeated Archelaios, M.'s lieutenant, while M. was himself defeated in Asia by Flimbris and sued for peace, which was granted by Sulla (81 B.C.). The second Mithridatic war (83–82 B.C.), which arose from the aggression of Murena, Rom. governor in Asia, ended in the latter's defeat by M. The third war lasted from 74 B.C. to M.'s death in 63, and arose out of M.'s seizure of Bithynia, which had been left by Nicomedes II. to the Rom. people. Lucullus was in command against M. and in the ensuing two years drove M. out of Pontus, and, marching into Armenia, defeated Tigranes and M. in two battles in 69 and 68 B.C. M., however, recovered Pontus owing to the mutinies of the Rom. armies and in 66 B.C. Pompey superseded Lucullus and defeated M. M., however, who was a man of remarkable energy and ability, would not yet admit defeat; but conceived the daring project of marching round the Euxine coasts, through the tribal lands of the Sarmatians and Getæ and invading Italy at the head of these

tribes. But his followers rebelled, including his son, Pharnaces, who was soon joined by the whole army and the citizens of Panticapaeum, who proclaimed Pharnaces king. M., determined not to become a Rom. prisoner, and took his own life at the age of about sixty-eight, after a reign of fifty-seven years. See study by T. Reinach, 1890.

Mitla, picturesque Zapotecan vil., 26 m. from Oaxaca (*q.v.*), Mexico, and the anct. Zapotecan cap. It lies in a valley near the old tn. of Tlacolula (*q.v.*), and long before the Sp. era it was known as Mietlan, or City of the Dead, and was the religious centre of an anct. civilization. The famous ruins which lie in the vil. as it still a part of it are unique in the elaborate quality of their design. The stone walls of temples and subterranean tombs are covered with a profusion of geometric pattern and the huge stones that form the buildings are so perfectly adjusted that the joints are hardly visible. Underground chambers and cruciform tombs honeycomb the soil beneath the ruined palaces. The 'hall of monoliths' has eight enormous columns, each a single stone. The Spaniards built a massive church with three red domes, which has the appearance of a medieval fortress. It was built in the court of an Indian temple, but the latter was not destroyed and its carved walls and painted lintels may be seen below the domes.

Mito, see MYTHO.

Mitrailleur, see MACHINE GUN.

Mitraria coccinea, evergreen flowering shrub of the family Gesneraceæ; sometimes grown in cold greenhouses and sheltered borders and rockeries.

Mitre, ordinary head-dress of bishops of the W. Church when vested. It exists in many shapes, of which it is generally agreed that the later medieval form is the most beautiful. It consists of two stiff parts united by soft material, so that they can lie flat on each other when the M. is not in use. It is worn by bishops, cardinals, and mitred abbots.

Mitscher, Marc Andrew (1887-1947), Amer. admiral, entered the naval academy at Annapolis in 1906. He joined the naval air station at Pensacola, Florida, and from then until the end of the Second World War in 1945, served continuously in naval aviation. In 1919 he was pilot of the aircraft which made the first U.S. Navy transatlantic flight from Newfoundland to the Azores, for which he was awarded the Navy Cross; later he controlled the organization of the naval team for international air competitions, including the Schneider cup race at Baltimore (1925). M. commanded the aircraft carrier *Saratoga* as head of the air dept., and later was appointed chief of staff of aircraft, Base Force, comprising the navy's land-based aircraft. In 1941, he was captain of the carrier *Hornet* from which the first air raid on Tokyo was launched under General Doolittle, and he also commanded the *Hornet* in the battle of Midway Is. In 1943 he commanded the Amer. Air Forces in the Solomon Is. campaign, and then com-

manded the aircraft carriers in the force under Adm. Spruance which evolved into the famous Task Force 58, perhaps the most powerful sea-borne air force of all time and the chief instrument in the crushing of the Jap. fleet in the Sulu and Surigao Seas off the Philippines. M. continued in the command during the subsequent campaign against Japan until July 1945 when, in accord with Amer. policy of automatic relief, he was made deputy chief of operations for air at Washington.

Mitscherlich, Eilhard (1791-1863), Ger. chemist, b. at Neuende, Oldenburg, and educated at Heidelberg Univ. He then studied chem. at Göttingen and Berlin. His work in crystallography led to the theory of isomorphism, communicated to the Berlin Academy (1819), for which he received the gold medal of the Royal Society of London. Pub. *Lehrbuch der Chemie* (1829), also papers to be found in *Abhandlungen*, Berlin Academy; *Poppendorf's Annalen*; *Annales de chimie et de physique*. His collected works were pub. by his son (1896), who wrote *Erinnerungen an Eilhard Mitscherlich* (1894).

Mittweida, tn. of Saxony, Germany. 12 m. N.E. of Chemnitz. Manufs. include textile fabrics and earthenware, and there are dyeworks, engineering works, and an electro-technical institute. Pop. 20,000.

Mitylene, see LISIROS and MYTILINI.

Mivart, St. George Jackson (1827-1900), Eng. biologist, educated at Harrow, King's College, London, and afterwards at St. Mary's, Ossett, since his conversion to Catholicism prevented his going to Oxford. He wrote *Lessons in Elementary Anatomy* (1873); *The Common Frog* (1874); and was elected prot. of botany and zoology at Kensington Rom. Catholic Univ. College. His researches on carnivora and insectivora much increased our knowledge of the anatomy of these groups. In his *Genesis of Species* (1871), which brought him into the controversies then raging on Darwinism and natural selection, M., while supporting evolution generally, denied that it had any application to the human intellect. His views on the relationship subsisting between human nature and intellect and animal nature in general he expounded in *Nature and Thought* (1882) and in the *Origin of Human Reason* (1889). He received the degree of Ph.D. from the pope in 1876, and M.D. from univ. of Louvain, Belgium, 1884, and occupied the chair of the philosophy of natural hist. at Louvain, 1890-93. M.'s articles in the *Nineteenth Century*, advocating the claims of science even where they seemed to be in conflict with religion, were placed on the *Index Expurgatorius* and just before his death he was excommunicated by the Rom. Catholic Church. Other works: *Man and Apes* (1877) and *Introduction générale à l'étude de la nature* (1882), etc.

Miveru, Lake, see MOHKO.

Mix, Tom (1880-1940), Amer. film actor, b. in El Paso co., Texas, U.S.A. Serving with the Amer. forces in the Philippines in the Sp.-Amer. war, and in the Boxer trouble in China, he fought with

the Brit. forces in the S. African war and was at the siege of Ladysmith. Sheriff in Kansas and Oklahoma, and deputy U.S. marshal in E. dist. of Oklahoma, he later was with the Texan rangers for three years, and livestock foreman on a ranch in Bliss, Oklahoma, 1906-9. He won the national riding and roping contest at Prescott, Arizona, 1909 and at Canyon City, Colorado, 1911. From 1910 he used these experiences in motion pictures, of which he wrote sev. scenarios himself. For years he appeared as the typical cowboy hero of wild W. pictures.

Mixtecs, or Mixtecas (Fr. *Mistèques*, Mexican *miztla*, dweller in the land of clouds), anct. civilised Indian race who migrated from the N. to S. Mexico, settling in the states of Oaxaca, Guerrero, and Tluebla, Central America. They were agriculturists and peaceably inclined, but brave warriors. Tepascoluta, Yanhuistlan, and Huajuapan are their chief cities. Both Mayan and Mexican characteristics are embodied in their culture. They number about 150,000.

Mixtures. If molecules of different kinds, whether elements or compounds, be brought together with the result that they merely mingle without losing their identity, then we have what is termed a mechanical M. in contradistinction to the term chemical compound. In such a mechanical M. the properties will be intermediate between those of the constituents, while these constituents can frequently be separated by purely mechanical means, and, further, the proportions of these constituents can be varied and are not fixed. Thus, gunpowder, a dark-grey solid, is composed of black charcoal, yellow sulphur, and white nitre, all of which are solid. The M. evidently possesses a colour intermediate between the three given colours, and, further, it possesses the saline taste of the nitre. By making use of the solvent properties of the constituents, the M. can be separated again into its component parts. Thus, since nitre is the only one soluble in water, it can be dissolved away in water, leaving the charcoal and sulphur behind. Then, since charcoal is soluble in carbon disulphide, it can be dissolved out in this liquid, leaving the sulphur behind. Besides separation in this manner by solubility differences, other qualities can be made use of in separation. Thus, iron can always be separated out of a mechanical M. by magnetic means. Again, because of differences in density, gaseous M. can be separated by diffusion (*q.v.*), and light and heavy solids by washing; because of difference of volatility, liquid M. can be separated by fractional distillation (*q.v.*); and because of difference in size of particles, solids can be separated by sifting and filtering. The basic difference between a mixture and a compound is that the latter consists of one kind of molecule only, while a mixture must consist of at least two different kinds of molecule.

Mizar (ζ Ursæ Majoris) has a faint companion near it, named Alcor, not physically connected with M., distance $11^{\circ} 50''$.

which can be seen with the naked eye, and when a small telescope is used M. is seen to be a double star, the brighter magnitude 2.4 and the fainter magnitude 4.0, combined magnitude 2.2. Observations over many years show that their distance apart remains about $14''$ and that one does not alter its position with reference to the other. Hence M. is an optical double, no physical connection existing between the two stars which merely happen to lie nearly in the same line of sight. But in addition, it has been found that M. is a spectroscopic binary and the most recent results given by Russell and Moore in *The Masses of the Stars, With a General Catalogue of Dynamical Parallaxes* are as follows; dynamical parallax $0^{\circ} 044$ indicating a distance of seventy-four light-years; distance between the components $24,000,000$ m.; period of revolution round their common centre of gravity 20 days $10\frac{1}{4}$ hrs.; combined mass of the two bodies, the mass of each being nearly the same, 6.5 times the sun's mass. These figures must be regarded as only approximate.

Mizpeh, or Mizpah (watch tower, name of sev. cities mentioned in the O.T.). It is thought that the modern tns. of Sh'fat, near Jerusalem, and Suf, which is 36 m. from the anct. Heshbon, have grown up on the ruins of former Ms. (1) M. of Benjamin was the scene of the gathering of the Hebs. after the slaughter of the Benjamites (*Judges xx.*); of Samuel's ministrations (*1 Sam. viii.*); and of Gedaliah's assassination (*2 Kings xxv.*). It was the scene of fighting between the Turkish and Brit. forces in the First World War. (2) Jacob made his peace with Laban (*Gen. xxxi.*) and Jephtha took his vow (*Judges xi.*) at M. of Gilead, and (3) David met the Moabite king at M. of Moab (*1 Sam. xxii.*).

Mjosen, or Miosen, largest lake of Norway, situated in Hamar and Christenv. Its length is 55 m., and the greatest width 12 m.; it has an area of 150 sq. m.

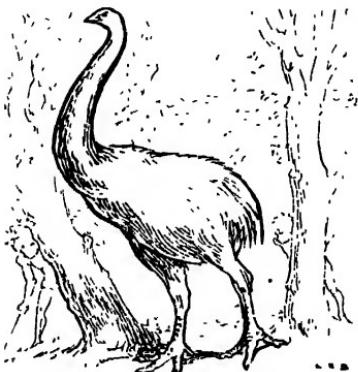
Mijet, see MELEDA.

Mnemon, see ARTAXERXES II.

Mnemonics, method or device constructed to assist the memory in difficult matters, e.g. dates in hist., mathematical constants, facts in geography, etc. Beyond the utilisation of association of ideas there is no scientific basis. The art was cultivated among the Iks. and Roms., Simonides among the former (fifth century B.C.), a poet famous for his memory, being generally credited with the first systematic device; this consisted in localising facts, so to speak. Each was associated with objects in the rooms of a house; when this was 'full' other houses, streets, dists., had to be associated. The system, so far as it was popular, relied on the rhetorical art so much cultivated. With the revival of learning, the subject again claimed attention, Roger Bacon writing *De Arte Memorativa*. A new system sprang up, in which letters of the alphabet were used for figures. The typical instance is the system of Feinagle, pub. in 1812. The figures 0 to 9 were represented by letters, *s, i, n, m, r, l, d, k,*

b, p. These are chosen specially, e.g. $m=3$ because of three strokes. To remember 1760 yds.—1 m., 1760 is represented by *i, k, d, s*, from which letters some word is invented by using further letters other than those in the system, e.g. 'thickheads,' which has the further advantage of being associated with poor memory. Dr. Edward Peck's *Memory and the Rational Means of Improving It* (1890) gives system that has had some vogue. Numbers may similarly be represented by sentences, each word containing the corresponding number of letters. The device of rhyming is used, e.g. for the genders of Lat. nouns: in weath her lore, 'evening red, and morning grey, two sure signs of one fine day.' Mention may be made of the Lat. tag, used for rememiring syllogisms in logic, beginning 'Barbara Celarent.' For the hist. of the subject, see C. F. von Aretin, *Systematische Anleitung zur Theorie und Praxis der Mnemonik*, 1810.

Mnemosyne, Gk. goddess of memory, the daughter of Heaven and Earth (Caelus and Terra) and the mother of the nine muses by Zeus.



Moa, native name for members of the extinct genus (*Dinornis*) of flightless birds of New Zealand. *D. giganteus* stood from 10 to 12 ft. high, had its legs enormously developed, and was probably capable of running at great speed; the head was very small. Other species included *D. struthionides*, about the size of an average ostrich, and *D. didiformis*, which was only about 4 ft. tall. They apparently existed in considerable numbers, and their complete extinction is believed to have been of very recent date. It would seem that they were hunted by a race inhabiting New Zealand before the advent of the Maoris between 900 and 1300. Signs of these people have been found on the Waitaki R. banks in S. Is. Possibly the birds were caught by lassos and floated down the riv. to vills. The genus was closely related to the genus *Epyornis*, of

which huge remains are found in Madagascar.

Moab, ant. kingdom to the S.E. of Israel, occupying the high plateau to the E. of the Dead Sea. Some account of the hist. of Moab is given in the biblical narrative (Exodus, Numbers, Deuteronomy, etc.). In the reign of David, Moab became subject to Israel, but later regained her independence for a certain period.

Moabites, inhabs. of Moab. The M. were closely connected with the Hebs., and the Moabite language, is a dialect of the Heb. The Moabite deity was Kemosch.

Moabite Stone, famous victory-stele of Mesha', king of Moab (middle ninth century B.C.), is a record of historical relations between Moab and Israel, which are glossed over or omitted from the Bible (2 Kings iii. 4-27). Until the discovery, in 1923 of the Akhiram inscription of Byblos (N. Syria), the M.S. was regarded as the earliest inscription in alphabetic writing. This monument was discovered in 1868 at Dibon by the Ger. missionary F. A. Klein, but while the negotiations for its removal were going on, it was broken up by the Bedouins of the place to get more money for it. Later it was partly restored and the missing parts have been reconstructed. It is now deposited at the Louvre Museum in Paris.

Moallakat, or **Mo'allaqat**, collection of seven Arabic poems, so called, according to popular tradition, because they were suspended by the Arabs in the Kaaba at Mecca.

Moawiyah (661-680), *see CALIPH*.

Moabangi River, *see UBANGI*.

Moberly, city of Missouri, U.S.A., in Randolph co., 50 m. N.W. of Jefferson City. There are lumber and flour mills and foundries. Pop. 14,000.

Mobile, city and port, co. seat of M. co., Alabama, U.S.A., on M. Bay. Raw cotton, timber, lumber, cereals, cattle, resin, and oil are exported; bananas, sisal grass, coffee, manganese ores, etc., are the staple imports. The industries are saw-milling, shipbuilding, and the manuf. of cotton, veneers and machine-shop products. Pop. 79,000.

Mobile Bay, Battle of, naval victory, 1864, gained by the Federals under Farragut over the Confederates under Buchanan.

Mobilisation (Army), setting in motion of the standing army. It consists in carrying out all the necessary arrangements for putting the army on a war footing. All orders, warrants, stores, etc., are kept ready for immediate issue, so that the mere order to mobilise is sufficient. Each unit is inspected fully, and the numbers of reservists required 'called up.' While these are assembling at the regimental depot or other assigned place, outfit and equipment for war are drawn from stores. Reservists are then equipped and join their unit. To facilitate rapidity, private firms are under contract for transport and rapid supply of food, clothing, etc. In addition railway facilities and shipping accommodation, previously arranged in the scheme, are secured and transport etc., impressed under the authority of the Army Act. In

1917, consequent upon the estab. of the Air Ministry, the power to impress aircraft was transferred from the military to the air-force authorities.

Moccassin, shoe of the N. Amer. Indian. Originally, an ingenious covering for the foot made all in one piece of untanned skin. Its advantage for the hunter or scout is obvious. The form and style differed with different tribes and individual fancy, but it was usually made of raw hide, with uppers of soft deerskin, and often embroidered with beadwork or decorated with porcupine quills. It has given place largely to similar articles made in leather and in several pieces.

Moccasin-snake, see COPPERHEAD.

Mocha, or **Mokha**, fort, seaport and town, the former cap. of Yemen, Arabia, on the Red Sea, 35 m. N.W. of the strait of Bab-el-Mandeb. It was formerly important for its trade in coffee, most of which now passes through Hodeida. Pop. 5000.

infirmary, but particularly of *Mimus polyglottus*, an Amer. bird, allied to the thrushes, which it resembles. It imitates a great variety of bird songs. The wings and tail are black, marked with white.

Mock Orange, or *Philadelphus coronarius*, hardy shrub (family Saxifragaceae) with large creamy-white flowers, possessing a fragrance rather like that of orange blossoms.

Mock Sun and Moons, or **Parhelia** and **Paraselenes**, development of halos of the sun and moon respectively. Added luminous circles, concentric, tangent, and intersecting are seen, some complete, others represented by arcs only; they often have straight lines or bands of light, sometimes forming a cross. For theory see HALO.

Mocrum, see MACARUSCA.

Mod, Gaelic word said to be derived from the Norse and equivalent to the A.-S. *moot* (as moot-hill, a place of meeting). It



FOUR EXAMPLES OF THE MODE

There were twelve fundamental ecclesiastical modes: left, examples of the Authentic forms (1) Ionian (2) Dorian; and Lydian, Phrygian, Aeolian, Mixolydian; and right, examples of the Plagal forms (3) Hypoionian, (4) Hypodorian.

Mocha, or **Mecca Stones**, are agates of which the colours are due to visible impurities. The M. stones or moss agates are filled with brown moss-like or dendritic markings distributed throughout the mass. They are obtained chiefly in Arabia, and are used as brooch stones.

Mock-heroic Poetry. From very early times burlesque has been a popular form of literature. The *Batrachomyomachia* was even attributed to Homer himself, and many anct. authoress besides Aristophanes delighted in handling trivial themes with mock solemnity. Among the moderns the absurdities of medieval romantics provoked in retort *Don Quixote* in prose, and in verse Pulci's *Morgante Maggiore* (1481) and Folengo's *Orlando* (1526), besides other burlesques. Among the best mock-heroes in Eng. are Chaucer's *Sir Thopas*, Butler's *Hudibras*, Pope's *Rape of the Lock*; W. B. Rhodes's *Bombastes Furioso*; and Shaw's *Admirable Bushville*; the duke of Buckingham's *Rehearsal* and Sheridan's *Critic* also contain good specimens. See F. Brile, *Englische Rokoko-Epik*, 1927; A. H. West, *L'Influence française dans la poésie burlesque en Angleterre entre 1660 et 1700*, 1930; and G. Kitchin, *A Survey of Burlesque and Parody in English*, 1931.

Mocking-bird, popular name of a number of birds, with exceptional powers of

was in old times specially connected with the holding of justiciary courts. The name was revived by an association called *An Comunn Gaidhealach*, formed towards the end of the last century to promote the study of the Gaelic language, literature, and music. A M., similar to the Welsh Eisteddfod, is held in the autumn at some place in Scotland, and prizes are awarded for Gaelic compositions, both literary and musical, recitation, singing, and playing.

Modder River, l. b. trib. of the Vaal. Orange Free State, S. Africa. It is 186 m. long, and flows into the Vaal some 30 m. above that riv.'s confluence with the Orange R. In 1899 the Brit. under Methuen were defeated here by the Boers. See SOUTH AFRICA, *History*.

Mode, in music, the grouping of intervals within the space of an octave, known also as octave scale, or species. Various Ms. have been, and are, in use in different parts of the world; e.g. Hindu music divides an octave into seven intervals, or twenty-two part-intervals; and Mohammedian music divides an octave into seventeen part-intervals, from which it derives nearly twenty different Ms. of seven primary intervals, which differ according to the relative position of the short steps. The Ms. familiar to W. civilisation are derived from the Gk. and eccles. diatonic Ms. (see HARMONY); they

are therefore known as diatonic, respectively major and minor, and are in theory the most correct (see HARMONICS). In the major diatonic M., the octave has its semitone intervals between the third and fourth, and between the seventh and eighth; the other intervals being whole tones; in the minor, the semitone intervals are between the second and third, and between the fifth and sixth. Some modern composers, chiefly Fr. and Russian, have made use of a 'tonal' mode, consisting of six whole tones. Ms. were named after the old Gk. provs., and after sev. complicated changes, the system settled down so that, e.g., the Lydian M. started at G on the piano keyboard, the Phrygian at F, the Dorian at E; in medieval Ms. the Phrygian began at E, the Dorian at D, and the Lydian at F. A few appearances of the M. occur in more modern times, as in Beethoven's *Adagio* 'in the Lydian Mode' in his A minor posthumous string quartet, op. 132, and by Vaughan Williams and other recent composers.

Modelling, art of making representations of things in wax, clay, stone, cardboard, etc., more particularly applied to the making of a sculptor's model. This is the original design from which the actual sculpture is made. Potter's clay, mixed with finely powdered sandstone to make it work easily, is the material used. Models of various kinds are used for an infinite variety of purposes, educational not less than artistic.

For the purpose of figure or other complex sculptural work 'in the round', clay models of all sizes, including life-size and over-life-size, are mounted on to an armature, consisting of iron supports and lengths of flexible metal tubing or, in the case of very large works, iron rods. These are shaped into the basic structural shape of the part to be modelled. A plaster mould is then taken of the model of which the bronze or plaster cast is made. An exact clay mould is also usually made for stone and marble statuary, reduced or full-size, of which a replica is then carved from the stone block. Terra-cotta sculpture is often modelled out of a solid piece of clay and the original work is fired in the kiln. See A. Toft, *Modelling and Sculpture*, 1905; F. J. Glass, *Modelling and Sculpture, with a brief History of the Art*, 1929; S. W. Anthony, *Pottery and Modelling*, 1931; and S. Jugger, *Modelling and Sculpture in the Making*, 1933.

Modena or **Mutina**, Tommaso Barisini da, also known as Tommaso da Barisino (fl. fourteenth century), painter of M. Nothing is known of his life. His chief works are a 'Madonna' in the chapel of the castle at Karlstein; another in the gallery at Modena; and a 'Madonna with Saints' in the Belvedere, Vienna.

Modena: 1. (Anc. *Mutina*) Prov. of Italy, in Emilia. Area 1002 sq. m. Pop. 373,000. 2. Cap. of the above, situated between the Panaro and Secchia, 23 m. N.W. of Bologna. The chief objects of interest are the Romanesque cathedral of St. Geminianus, dating back to the

eleventh century; the ducal palace; the Albergo Arti, with its priceless library, the Biblioteca Estense, and picture gallery, including works of many of the great It. masters; and the univ., founded in 1678. The chief manus. are silk, hats, glass, and leather. From 1288 the tn. was under the rule of the family of Este. Its dukes were expelled in 1860, when Modena was incorporated in the kingdom of Italy.

The Allies took M. on April 24, 1915. The prin. damage to the city was sustained in an air-raid on May 13, 1944, but more than half the chief monuments are intact and the rest relatively lightly damaged. Some five churches were hit, but only that of S. Vincenzo suffered grave damage. The archiepiscopal palace was slightly damaged, but the palazzi del Collegio S. Carlo and della Congregazione di Carità were severely damaged. Pop. (com.) 112,800. See also CITTANOVÀ.

Moderator, the presiding minister in the courts of the Presbyterian Church, i.e. the presbytery, synod, and ann. general assembly. The Ms. are elected from the elders, and hold office for one year. In the Assemblies they have only a casting, not a deliberative, vote.

'**Modern Churchman, The**', quarterly magazine, pub. by Blackwell of Oxford; editor, Dr. Major. Founded in 1911 to maintain the ideals of Broad, Liberal, and Modernist members of the Church of England, particularly in relation to modern Biblical criticism and modern science, its motto is 'By identifying the new learning with heresy, you make orthodoxy synonymous with ignorance' (Erasmus).

Modernism, comprehensive term denoting a number of separate religious movements which arose within the Rom. Catholic Church in the nineteenth and early twentieth centuries, largely as the counterpart of the movement towards social freedom. It has been well defined by G. Tyrrell, one of its prin. exponents, as 'the desire and effort to found a new theological synthesis consistent with the data of historic-critical research.' M. was directed towards: (a) A new apologetic in which the traditional scholastic method should be abandoned and the cardinal points of Christian faith estab. through a modern evolutionary and dynamic theory of the universe; (b) Historical criticism. This set out to distinguish the spirit and form of dogmatic formulæ and to reconcile the truth-value of dogma with its historical development; (c) Ecclesiastical reform. No detailed programme, however, was put forward by the modernists. Among the leading exponents of M. were: in France, E. Le Roy and A. Loisy; in Germany, J. Schnitzer; in Italy, R. Murri and U. Frassassi; and in England, Baron F. von Hügel and Father G. Tyrrell. During the pontificate of Leo XIII. (1878-1904) none of the new teaching was condemned, though the Holy See took various steps to discourage and reprove them. But with the accession of Pius X. immediate steps were taken of a more drastic nature. Various modernist works were placed on the Index, a number of leading eccles. authors were suspended,

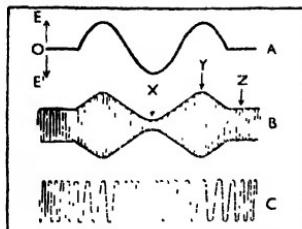
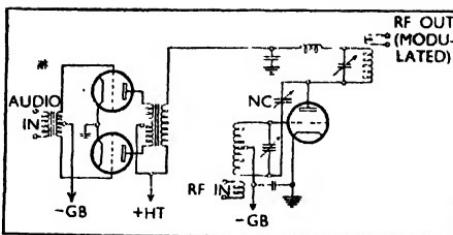


FIG. 1 (left). A, MODULATING VOLTAGE; B, AMPLITUDE-MODULATED CARRIER;
C, FREQUENCY-MODULATED CARRIER

FIG. 2 (right). PLATE-MODULATED AMPLIFIER



and finally on Sept. 3, 1907, the whole body of modernist doctrine was solemnly condemned by the celebrated encyclical *Pascendi Dominici Gregis*. All Rom. Catholic priests are still required immediately after ordination to take an oath against M. See, besides the works of those mentioned above, A. Houton, *Histoire du modernisme catholique*, 1912, and M. Petre, *Autobiography and Life of George Tyrrell*, 1912.

Modestinus, Herennius, famous Rom. jurist, a pupil of Ulpian, and one of the councillors of the Emperor Alexander Severus (c. 250). In the *Digests* of the Justinian Code he is classed as one of the highest legal authorities, and a large number of his dicta are cited.

Modica, tu. of Sicily, 32 m. W.S.W. of Syracuse. Oil, wine, and grain are the chief products. There are remains of megalithic buildings. Pop. 56,000.

Modigliani, Amadeo (1884-1920), It. painter and sculptor, b. at Leghorn, part Jew, part It., studied in the Lat. quarter, Paris, in which city he settled. He made a special study of primitive art, and as a young man produced some sculptures which showed the influence of Negro masks. His work classes him as one of the real leaders in modernism in art. It is highly original, and his paintings are remarkable for the curiously elongated heads of their subjects. In his time he seems to have been the idol of the Lat. quarter, but drink and consumption killed him at an early age. See lives by A. Salmon, 1926; E. Schaub-Koch, 1933; also F. Carco, *L'Ami des peintres*, 1944.

Modillion, in architecture, a Fr. word of Lat. derivation, signifying the lato oblong projections bearing a leaf or scroll on their under side which are arranged beneath the cornice in Corinthian entablature. A fine example is found in the choragic monument of Lysicrates, Athens.

Modjeska, Helena (1844-1909), Polish actress, was the daughter of a musician, Michael Opido. She first made a reputation for herself in Cracow, and afterwards in Warsaw, where she played leading roles in 1865-76. In the latter year she sailed for California with her second husband, Count Chiapowski. Their attempt to live on a ranch failed, and Madame M. returned to the stage, making a sensation at

San Francisco with *Adrienne Lecourrue*. She was famous for her highly coloured interpretations of Ophelia, Desdemona, Juliet, Beatrice, and other Shakespearian heroines, and acted also in the plays of de Musset, Sardou, Dumas, and Schiller. Modlin, see NOVO-GIORGIEVSK.

Modoces, N. Amer. tribe of a warlike and aggressive nature, formerly dwelling on the extreme N.E. frontier of California. Originally they formed one tribe with their N. neighbours, the Klamath, and, on seceding from this tribe, estab. themselves on Lost R. Most of them perished in the revolt of 1873, and some of the survivors were transported to the Nuapaw reservation in Indian ter.

Modulation. A simple radio wave or 'carrier,' as it is called, conveys no intelligence apart from the fact that a transmitter is in operation. In order that communication may take place changes must be made to this carrier depending upon the information to be conveyed; perhaps the simplest example of this is the way in which the carrier may be keyed on and off in accordance with the symbols of the international code. If, however, speech, music, or pictures are to be transmitted a more complex process must be employed, and the action of impressing such forms of intelligence on the carrier is known as M. It can be carried out by causing changes to be made to any one of the characteristics of a carrier, namely, its amplitude, frequency, or phase, and while it is emphasised that ideally only one of these should carry the M., in practice small amounts of M. do often occur in one or both of the remaining two, leading to different forms of distortion at the receiver. M. in a form other than that intended is undesirable as, in addition to receiver distortion, it results in dissipation of transmitter power in unwanted directions.

Amplitude Modulation.—The method generally employed for medium, long, and short wave broadcasting is amplitude modulation (A.M.), which was, in fact, adopted from the earliest days as it has the advantage of being economical in channel space. As the name implies, the carrier amplitude is made to vary in sympathy with the electrical impulses which have been generated by the speech or

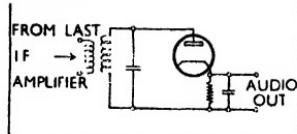


FIG. 3.

DETECTOR CIRCUIT:
SUPERHETERODYNE RECEIVER

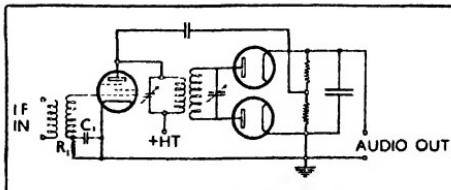


FIG. 4. F.M. RECEIVER AND LIMITER VALVE

music to be transmitted, and reference to Fig. 1 will enable this to be more easily understood. If the modulating voltage is increased to a point where the carrier amplitude at the point X becomes infinitely small, without actually reaching zero, then the depth of M. is said to be 100 per cent, and the carrier is fully modulated. When this occurs the amplitude at the point Y is just twice that of the unmodulated carrier Z. The production of an A.M. carrier at high efficiency involves the use of considerable modulating power, and the modulator must be designed to deliver an output equal to half the input power to the amplifier to be modulated. Fig. 2 shows an arrangement for a plate-modulated amplifier. Receivers for A.M. are relatively simpler than those required for other systems since it is only necessary to convert the amplitude-modulated carrier into the audio-frequency voltage, which also varies in amplitude. Fig. 3 shows a typical detector circuit as used in a superheterodyne receiver.

Frequency modulation (F.M.) has only come into prominence since 1939, largely owing to the work of E. H. Armstrong in his paper 'A Method of Reducing Disturbances in Radio Signalling by a System of Frequency Modulation,' and also to the development of very high frequency (V.H.F.) broadcasting. Transmitters for F.M. are, in general, simpler than their A.M. counterparts, and the modulating power required is, in all cases, small, use often being made of a varactance valve in conjunction with the oscillator controlling the transmitter frequency. The modulating voltage is applied to this first valve in such a way as to vary its reactance so that the oscillator frequency is made to swing about a mean value at a rate corresponding to the audio-frequency being transmitted and by an amount proportional to this voltage. This deviation, as it is called, is expressed in kilocycles per second. As has been stated, an F.M. receiver is more complex than that for A.M., and the process of detection is carried out by means of a 'discriminator,' whose output voltage is, within limits, linear for a given deviation of the radio-frequency input. A typical circuit is illustrated in Fig. 4, which also shows the limiter valve which precedes it. The latter is most important if the full advantages of F.M. are to be realised for it limits the A.M. components which may result from natural or man-made inter-

ference, and prevents them reaching the discriminator. In passing, it is interesting to note that the limiter acts similarly to a 'leaky-grid' detector so that, if the receiver is to be used both for F.M. and A.M., the A.M. output is obtained across C_1 and R_1 .

Phase Modulation (P.M.), whilst different in principle to F.M., is nevertheless similar when the resulting carrier and sidebands are examined and, at the same time, the receiver is on the same lines as that for F.M. M. is effected by causing the speech wave to shift the phase of carrier to its sidebands.

It can be said that the advantages of F.M. and, to a certain extent P.M., over A.M. are: (1) Improved signal to noise ratio for a given field strength, as it discriminates against noise which is A.M. in character. (2) Simplicity of M. equipment at the transmitter and low modulator power. (3) Better intelligibility at the edge of the service area by virtue of an inherent 'capture' effect which tends to make the receiver hold the wanted signal. (4) Greater volume range for music which obviates much volume compression. The disadvantages are: (1) F.M. and P.M. require a wide band of frequencies for their transmission, thus restricting them to the V.H.F. region of the radio spectrum. (2) The receivers are more complex than those required for A.M. (3) F.M. is more susceptible to selective fading than A.M.

Modulation, in music, signifies a change of tonality or key, and is in one of three classes: diatonic (natural), chromatic, or enharmonic (both artificial). The term is also used to express graduation as regards quantity of sound. See also HARMONY. See C. Zoller, *The Art of Modulation*, 1930.

Modulus, in physics, a constant quantity depending on the properties of matter, when these properties are expressed by means of mathematical equations. The chief moduli occur in questions of elasticity. Thus when an elastic string is stretched Hooke's law states that the strain produced is proportional to the extending force. Now, if a constant k is introduced which converts this statement into an equality, k is called a modulus of elasticity. Expressed symbolically, if T = extending force in lb. per square inch, l = the normal length of the string, and l' = extended length, then $T = \frac{k(l-l')}{l}$.

Clearly then, if $P = 2l$ then $T = k$, thus k is equal to the tension in the string when extended to twice its normal length; k in this case of simple extension is called Young's modulus. A body subjected to a force may be altered in shape or in size, or may be altered in both shape and size. When the force merely produces a change in vol. the equation stress = $k \times$ strain is still true, and in this case k is called the modulus of bulk. If the force, or stress as it is most frequently called, produces a change of shape, then k is called the modulus of rigidity. The term modulus has some significance in mathematics. In the theory and practice of logarithms it is the number by which the logarithm of a number to a given base is multiplied in order to convert it into its logarithm to a different base. The symbol $\{+ 16\}$ means plus +, and shows the value of the magnitude without regard to sign. This symbol is termed M.

Moe, Jørgen Ingebrektsen (1813-82), Norwegian author, b. on the Moe estate, Ringerike, Norway, of peasant parents. He studied theology at Christiania, and became a clergyman in 1853. He was ultimately appointed bishop of Christiansand (1875), where he d. M.'s first pub. was *Samling af Sange, Folkeriser og Steri Norske Almuedialekter*, a collection of folk-songs (1840). Two years later, in collaboration with Christen Asbjørnsen, he pub. Norwegian folk-tales, *Norske Folke-Eventyr* (2 series, 1842-44 and 1871). As a poet, M. is best known by his *At Lange paas juletræet* (1855). His *Sunlede Skrifter* appeared in 2 vols. (1877).

Moshringia, genus of perennial plants (family Caryophyllaceae) now incorporated in the genus *Arenaria*.

Moen, is. of Denmark, lying between Zealand and Falster. It is divided from the former by Clev Sound and from the latter by Grou Sound. It is 20 m. long and has an area of 86 sq.m. It actually consists of seven is., gradually joined together by the receding of the sea, and nine centuries ago it was still divided into three. It is the highest is. of Denmark after Bornholm, with precipitous limestone-cliffs (500 ft. high) on its E. extremity which is called Moensklint. The soil is chalky and fertile. Its chief tn. is Stege. It has a lighthouse visible for 14 m. Pop. 16,000.

Mooran, Ernest John, Eng. composer, b. 1894 in London, of Irish descent. He was educated at Uppingham School and afterwards studied at the Royal College of Music in London. His studies were continued with John Ireland, after service in the First World War. He first came to public notice in 1923 with a London concert. His works include *Magnificat* and *Nunc Dimitis*, Te Deum and Jubilate, two anthems, a symphony in G minor, concertos, trios, etc., and a number of songs, including the cycles *Ludlow Town* (from A. E. Hotchner) and *Seven Poems by James Joyce*. Songs of Springtime, and arrangements of folk-songs of Norfolk, Suffolk, etc.

Morris, Lake, 35 m. long and $4\frac{1}{2}$ m.

broad, situated in the prov. of Fayum, Central Egypt. It is now known as Birket-el-Karun. Once much larger, on its banks was the labyrinth described by Herodotus; Amenemhat III. was responsible for the embankment of the lake. See R. H. Brown, *The Fayum and Lake Mæris*, 1892.

Moritherium, extinct animal found in the Middle Eocene beds of Egypt, not larger than a tapir, and undoubtedly the earliest form yet discovered of the proboscidean group of mammals. This, with others recently discovered in Egypt, affords a most important link between existing elephants, which some authorities regard as properly belonging to a distinct order, and other ungulates. The second pair of incisors in each jaw exhibit an enlargement which is accepted as a stage from which the four-tusked mastodons (*Tritylodon* or *Tetrabelodon*), with a snout-like muzzle instead of a trunk, evolved.

Moero, or Mweru, Lake, 76 m. long and 25 m. broad, was discovered by David Livingstone in 1867, and further explored by Sharpe in 1890; it lies 90 m. S.W. of Lake Tanganyika in Central Africa.

Mesia, anct. Iton, prov. occupying the ter. S. of the Danube, and corresponding to Bulgaria and Serbia. It was first inhabited by Thracians, then by Celts, and was conquered by the Romans, in 29 B.C. The Emperor Domitian divided it into two provs., M. Superior and M. Inferior. See MESO-GOTHIC.

Moeskroon, see MOUSCRON.

Moso-Goths, name given to certain Visigoths who settled in Lower Mosia (q.v.), at the mouth of the Danube, in the third and fifth centuries. They were converted to Christianity by Ulflas, who trans. the Bible for them.

Moffat, James (1870-1944), Scottish theologian and translator of the Bible, educated at Glasgow Academy and Univ. Ordained in 1896, he was Yates prof. of Gk. and the N.T. at Mansfield College, Oxford, 1911-15. He will be chiefly remembered for his new trans. of the Bible. In 1924 he revised an earlier version of the N.T. which he had pub. in 1899, and in this new version he used modern and colloquial phraseology. He subsequently made a similar version of the O.T., publishing Genesis and Esther in 1924, and the remainder in the succeeding year. His trans. did not escape hostile criticism, some regarding his colloquialisms as vulgar, while others took exception to the Scottish vernacular terms. M. was prof. in the college of the United Free Church of Scotland for some years, and was prof. of church hist. in the United Theological Seminary, New York, where he d. His pubs. also include *Introduction to the Literature of the New Testament* (1911); *Hebrews—International Critical Commentary* (1924); and *Everyman's Life of Jesus* (1924).

Moffat, Robert (1795-1883), one of the pioneers of missionary work in Africa, and father-in-law of David Livingstone, was a native of Haddingtonshire. In 1814 he offered his services to the London Miss

sionary Society, and in 1816 he was sent out to S. Africa, where he worked with great success in Namaqualand, converting the chief, Afrikaner. Afterwards, having married (1819), he and his wife spent nearly fifty years mainly among the Griquas and Bechuanas. His *Missionary Labours and Scenes in South Africa* appeared in 1842. See J. S. Moffat, *Lives of Robert and Mary Moffat*. 1885.

Moffat, police burgh, burgh of barony (1635), and par. of Dumfriesshire, Scotland, on the Annan, 20 m. N.E. of Dumfries. It is noted as a health resort. Pop. 3400.

Mogadishu, or **Mogadiscio**, cap. of It. Somalia. The old Arab tn. is interesting. The modern tn. is well laid out, the main artery being particularly fine. There is good communication by road with Nairobi. A breakwater of 3000 ft. was in process of extension so as to enclose a sheltered harbour, when war broke out. The tn. was captured by imperial forces under Gen. Cunningham in 1911 in the campaign which resulted in the fall of the whole of It. E. and N.E. Africa. Pop. 55,000, including 8000 It.

Mogador, or **Es-Sueira**, chief seaport of Morocco on the Atlantic, and next in importance to the city of Morocco. Its exports include gum, w., olive oil, and skins. Pop. about 28,600.

Mogila, Peter (c. 1596-1647), Russian prelate, belonging to a Wallachian family of rank. He was metropolitan of Kiev from 1632 until his death. He drew up a *Catechism* (1645) and the famous *Confession of Faith of the Orthodox Greek Church in the East* (1643), accepted by the synod of Jerusalem in 1672.

Mogilev, or **Mohilev**: 1. Region of the Byelorussian S.S.R., bounded on the N. by Vitebsk, E. and S. by Smolensk and Tchernigov, and W. by Minsk. The chief rly. is the Dniester, which enters M. in the N.E., runs westward as far as Orsha, and then flows S. to its junction with the Beresina. The prin. occupations are agriculture and cattle breeding. Corn, rye, oats, and barley are grown. The chief tns. are M., Chausy, Orsha, etc. Area 18,700 sq. m. Pop. 2,560,000. 2. Cap. of the above region, stands on the Dnieper, 94 m. S.W. of Smolensk. Its cathedral was founded in 1780. It has artificial silk works, tanneries, and ironware factories. Pop. (1939) 99,500. It was occupied by the Ger. soon after the launching of the invasion of 1941 and remained in Ger. hands until the middle of 1944. The Russian advance of 1943 took their forces within 25 m. of M. by the end of the year, but Ger. resistance was tenacious and no further progress was made for some time. It was the breaking of the 'Fatherland line,' a string of bastions from Vitebsk to Zhlobin whose defences had withstood repeated Russian assaults through the winter, that brought about the fall, to Gen. Chernyakovsky of Vitebsk, one of the strongest focal points of the line, and with it that of M. M. fell to Gen. Zakharov, who forced the Dnieper above the tn. and captured it in a frontal assault after a day of street

fighting (June 28, 1944). 3. Or **Mogilev-Podolski**, tn. in the Ukraine S.S.R. on the l. b. of the Dniester, named after the Moldavian hospodar, Mohila. It has flour-mills and sugar refineries. It was long contested between the Poles and Cossacks, but was finally taken by the Russians at the end of the eighteenth century. Pop. 30,000.

Mogul, Moghal, or Mughal, Arabic and Persian forms of Mongol, is usually applied to the Mohammedan empire in India, founded by Baber, a descendant of Tamerlane, in 1526. The emperors of Delhi were usually styled the Great Moguls. The M. Empire crumbled after the death of Aurungzebe (1707) and the rule of the Ms. came to an end after the Indian mutiny in 1858, the last of the line dying in imprisonment at Rangoon in 1862. See also *AKBAR; INDIA; History*.

Mogul Painting, see *INDIA, Indian Art*.

Mohacs, tn. in the prov. of Baranya, Hungary, on the Danube, 25 m. E.S.E. of Fünfkirchen, otherwise Pécs. Two famous battles were fought at M. On Aug. 29, 1656, the Turkish forces of Soliman the Magnificent annihilated those of Louis II. of Hungary, and went on to capture Buda. On Aug. 12, 1687, Charles of Lorraine defeated the Turks, in a campaign which drove them out of Christian Europe. Pop. 17,300.

Mohair, see *Wool*.

Mohammed, or **Mahomet** (properly Muhammad, 'the praised' or 'the desired'), also **Mohammad** (c. 571-632), the founder of Mohammedanism, or the faith of Islam. He named his religious system Islam or Hanif, apparently 'devoted.' M. himself was of the Banu Hashim, who are said to have claimed the position actually enjoyed by the Banu Ummaya, but this assertion seems to have originated in the claims to the caliphate which the Hashimites (the house of Ali and the Abbasids) subsequently opposed to those of the Ommayads. His father, Abdallah, came of good Arab stock, and was a member of the tribe of Koreish. M. was a posthumous child, and his mother, Amina, lived only till his seventh year; on her death his grandfather, Abd-al-Muttalib, took charge of him, and on his death at the end of only one year, M. was adopted by his uncle, Abu Talib. The child was an epileptic, and was of a melancholy, thoughtful disposition. Most of his early life was passed in tending flocks of sheep and herds of camels; he had little or no education, and as a lad could neither write nor read. His grandfather had been a man of considerable standing, and had taken charge of the Temple and the Holy Well in Mecca, so that the boy must have seen and known many pilgrims and holy people. His uncle was a poor man, and until twenty-six years of age M. worked hard for his living like any other young Arab. In his twenty-sixth year a wealthy widow, named Khadija, fell in love with him and married him; she was fifteen years older than M., and appears to have been a woman of great good sense and patience, with a whole-hearted belief in her young husband

that materially helped him in his subsequent career. As a young man he naturally worshipped at the Kaaba, the great sanctuary of Mecca, originally a local sanctuary of the Koreish tribe. The Kaaba contained the image of Hobal, their tribal god, also sev. other deities belonging to other tribes, and, more sacred than all, it held the famous 'black stone' of Mecca (q.v.), 6 to 7 in. square, built into the walls of the Kaaba, traditionally held to be a stone from Paradise brought down by the angel Gabriel.

M.'s first battle took place when he was quite a young man, in a blood-feud between his tribe and the tribe of Hawazin, in which he did not distinguish himself or sh. w. any of his later military spirit. After his marriage with Khadija he seems to have been a partner in a produce-shop. During his thirty-fifth year the Kaaba was wrecked by a great storm. No person could be found who would venture to replace the sacred stone in the wrecked shrine, and it was finally decided that the first man who entered the court by chance should be the chosen one. To M. fell the honour. All his life the prophet had been interested in theology, and he had been slowly forming his new belief in one God, but as yet he had not proclaimed himself a prophet. His first revelations came to him in a cave in Mt. Hira, where he had retired with his wife for meditation. Here he appears to have had visions and religious ecstasies. Khadija, at first alarmed about his health, later, when he declared the angel Gabriel had appeared and spoken with him, at once believed him to be a prophet. He now put his new doctrine into the famous formula, 'There is no God but God, and Mohammed is the apostle of God.'

Among the people of Arabia the early Semitic religion had survived with little change save deterioration. It had many deities, of whom Allah was chief, but scarcely worshipped. The worship of natural objects, of stones, like the Kaabah, and of images, was practised. Debased forms of Judaism and Christianity also flourished. Many Arabs, known as Hamites, rejected these, as well as the native faith, held a simple monotheism and absolute submission to Allah, and practised asceticism and meditation. M. came in contact with all these faiths, and his doctrine developed out of them, particularly from Hamitism. His originality lay in his putting monotheism on a firm foundation, proclaiming it as an absolute revelation, and making it the centre of a definite creed and worship.

For the first few years his faithful wife, his friend Abu Bekr, and his adopted slave Zaid worked in secret, converting only a few. Meanwhile the revelations became more frequent, and during his trances he uttered messages which were carefully remembered and written down. They varied in subject, from hist. and magic to religious teaching and formed the beginning of the Koran (q.v.). His friends were aware that as a boy he was subject to fits, but they believed these later seizures to be inspirations from God. His attitude

to Jews and Christians at this period was friendly and conciliatory. The first religious meetings were held on Mt. Safa, where M. boldly proclaimed himself to be the prophet of Arabia. From here he preached his doctrine to the people of Mecca, denouncing idolatry, preaching heaven and hell, and declaring Allah to be the only God.

His followers were named Muslim (Moslems), which, as apparently meaning 'traitor,' 'surrenderers,' remains difficult to understand. The fury of the tribe of Koreish, who had charge of the holy shrine, merely added energy and fervour to his preachings, and he threatened the non-believers with awful tortures in hell, and petrified Mecca with his furious eloquence. He estab. himself in the house of a rich convert in the centre of the tn., and held frequent meetings. The Moslems now began to be cruelly persecuted by the Meccans, and the prophet was blockaded in his own house, for though persons might be starved to death, no blood must be shed in the sacred city. After a revelation that the goddesses of Mecca existed as well as Allah, the siege was raised, but once free M. asserted that the revelation came from the devil, and the trouble was renewed. Khadija d. about this time, and also Abu Talib, and his strongest influence for good and his protectors were thus removed. The prophet was forced to flee from the wrath of the Meccans to Yathrib, afterwards called Medina. This is the *Hijra* (Hegira), Sept. 22, A.D. 622, from which Moslem chronology dates as A.H. 1.

From the hour of the *Hijra* Islam began its career of conquest, and M. his role of statesman, lawgiver, soldier, and king. With success came the weaknesses which stained his career, and the revelations by which he excused them. The divine sanction claimed by M. for wholesale slaughter, and his love of women, cannot be excused. M., in trying to realise a great idea, came into contact with the world, and had to place himself on a level with it, and thus rendered himself liable to deterioration. In this respect he compares unfavourably with Buddha; and his weaknesses reacted on his religion, and became its most dominant notes. M. bound his followers to himself by the strongest ties, and caused both helpers and followers to intermarry. He contracted sev. marriages himself, one wife being Ayesha, aged nine, the infant daughter of Abu Bekr.

The first Moslem mosque was built at Medina, and an arranged code of laws estab., dealing with ceremonial washing, praying five times a day with the face turned towards Mecca, abstinenace from the drinking of wine, and the abolition of infanticide. Prayers were formerly directed to Jerusalem, until the prophet found that no compromise could be made with the Jews. He also estab. the call to prayers, *muezzin*, and Friday as the sacred day of the week. He enforced the 'fast of Ramadhan,' a period when no food may be eaten from sunrise to sunset. The prophet next began his series of campaigns,

the first successfully directed against the Meccan caravans. The second resulted in the victory of Badr (Bedr) (A.D. 629). The prophet's plundering expeditions added great wealth to Medina, while his army rapidly grew strong, and in A.H. 8 (A.D. 630) he marched on Mecca with 10,000 well-disciplined men, easily conquering the most sacred city of Arabia. The next year the great pilgrimage was managed by the Moslems, and very quickly Mecca itself was a Moslem town. M. no longer showed mercy; all unbelievers were to be slain, his soldiers became fierce religious zealots, who died cheerfully for the faith and the promise of Paradise held out by the prophet. The conquest of Mecca brought thousands of converts to the white standard of the prophet, and in one year his army grew from 10,000 to 30,000 men. The subjugation of Arabia was assured.

The last years of M.'s life were spent in a succession of victories, especially that of the 'Day of Honain' against a confederacy of tribes. He died of some fever at the age of sixty-three or sixty-five. The date of his death was 12 *Rabia*, A.H. 11, the A.D. equivalent of which is June 7, 632. His beloved wife Ayesha was with him, and he was buried on the spot where he died in Medina. The traditional appearance of M. seems to have been that of a middle-sized, heavily built man with a large head and big, thick hands and feet, with long hair and dense beard; his eyes were said to be tinged with red. He left no son to succeed him.

After his death the sayings of his revelations were collected, and being bound together formed the Koran. These sayings were scratched on bones, written on palm leaves, and some on parchment, and there could at the time be no proof that some were not spurious. M.'s revelations during twenty-three years form the contents of the Koran, but their final arrangement, arbitrary, and inconsecutive, was made long after his death. M. had given his world a new religion, and a new code of laws, many of which he was the first to violate, though always excused by a special revelation. For the effect of his teaching and its far-reaching influence see MOHAMMEDANISM, and for the succession after his death see CALIPHATE; see also ISLAM; SHITITES and SUNNITES.

See W. Irving, *Mahomet and his Successors*, 1849; Sir W. Muir, *Life of Mahomet*, 1856-61 (4 vols. and abridgment, 1 vol.); A. Spenger, *Das Leben und die Lehre des Mohammeds*, 1861-65; Syed Ameer Ali, *The Spirit of Islam*, 1896; T. Arnold, *The Legacy of Islam*, 1896; D. S. Margoliouth, *Mohammed and the Rise of Islam*, 1905; A. Muhammad, *Mohammed*, 1924, 1948; H. Pirenne, *Mohammed et Charlemagne*, 1937; and R. V. C. Bodley, *The Messenger*, 1948.

Mohammed II. (1430-81), sultan of Turkey, called the Conqueror, b. at Adrianople, succeeded his father, Amurath II., in 1451. Taking Constantinople in 1453, he next fortified the Dardanelles, conquered Greece and most of the Balkan states, while at sea he became the terror of

S. Europe. He died in an expedition against Persia.

Mohammed V. (1844-1918), penultimate sultan of Turkey, b. at Constantinople. When the Turkish revolution occurred in 1909 at the instigation of the 'Young Turks' committee, the army under Shevket Pasha (assassinated 1913) took possession of Constantinople, deposed and exiled the Sultan Abdul Hamid, and replaced him by his brother, M. Reshid. M. V. died in 1918 and was succeeded by his brother Vahid-ed-Din, who was declared deposed in 1922 and was the last Turkish Sultan.

Mohammed Ahmed, see under MAHDI.

Mohammedan Art. After the death of Mohammed, in the seventh century, many countries came under the conquering influence of the Arabs, and there grew up a distinct form of M. A. and culture, to be found principally in Syria from A.D. 650 to 1400, in Persia and Egypt from 700 to 1900, and in India from 1556 to 1800, while it is also traceable in Turkey and some parts of Africa. The chief arts practised by the Muslims are architecture and miniature painting. There is little Mohammedan sculpture except in the form of ornamental carving, but metal and bronze work is common. Mohammedan crafts include ceramics, fabric and carpet-weaving, enamelling, tile-making and mosaic work, and the manufacture of weapons, glass and crystal ware.

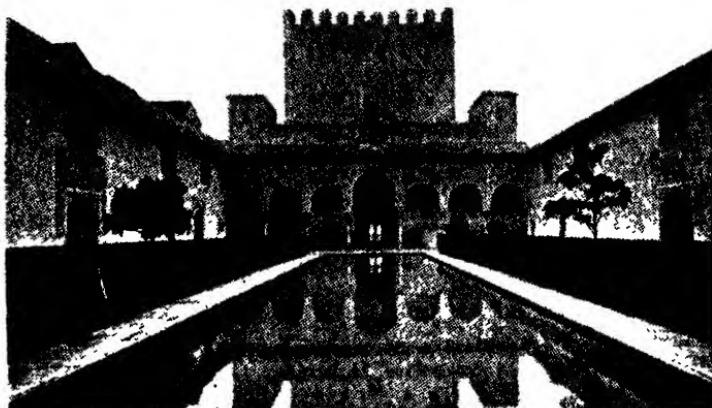
The chief form of Mohammedan architecture is the mosque. Originally the mosque was a room in which Mohammedans could gather together for worship; the room contained no idols, was open to the sky, and had a niche to indicate the direction of Mecca. Later the architecture of the mosque became more elaborate. Mohammedans were called to prayer by a loud call which was uttered from the top of a high tower built for this purpose. These towers or minarets were either attached or built close to the mosque. The most distinctive features of Mohammedan architecture are the domes and radiating arches. This style is common to all Mohammedan buildings, and that of the mosques in India can be traced to the mosques built in Bagdad in the time of the Abbasid caliphs during the eighth and ninth centuries. Subsequent to that period is the vaulted architecture of Mesopotamia. The M. A. of India is to be found chiefly in the mosques and tombs and in painting. The mosque of Mahafiz Khan (fifteenth century), the Small Golden Mosque in Gaur, built of basalt in A.D. 1500, and the Pearl Mosque of Agra (1653) are among the most representative of Mohammedan mosques in India, while other famous Mohammedan buildings are the palace of Delhi, begun in 1638, and the memorial tomb, the Taj Mahal, the inscription of which was set up in 1646. In these Indian mosques much lattice work carving in wood and stone has been executed, the designs being of varied conventional pattern. Mosaic and inlay work were also used for decoration together with enamelled tiles, but this latter reached a greater perfection as an art in Persia.

There are sev. fine examples of Mohammedan architecture in Spain. The Alcazar and Giralda at Seville are notable in a city which is more prominently Moorish than any other Sp. tn.; the former, of the fourteenth century, and the latter, the bell-tower of an old mosque, show features such as arches, slender shafts, and open trellis work, which evolved from It. originals through Byzantine practice. Stucco decoration is well represented in the Alcazar, and in the Alhambra at Granada. The early period of the mosque is illustrated by that at Cordova (perhaps the finest specimen of Mohammedan architecture in Europe), of the eighth to tenth centuries.

design, and among other things coins were decorated in this manner.

See P. Brown, *Indian Painting under the Moguls*, 1924; E. Diez and H. Gluck, *Die Kunst des Islams*, 1925; G. Migeon, *Manuel d'art musulman*, 1927; T. W. Arnold, *Painting in Islam: a Study of the Place of Pictorial Art in Muslim Culture*, 1928; E. D. Ross, *Persian Art*, 1930; V. Smith, *History of Fine Art in India and Ceylon*, 1930; M. Dimand, *A Handbook of Mohammedan Decorative Art*, 1930; and K. A. C. Creswell, *Early Muslim Architecture*, 1932.

Mohammedanism, faith of Islam, the religion preached by the prophet Mohammed (*q.v.*). The sacred book of the faith



THE COURT OF THE MYRTLES THE ALHAMBRA, GRANADA

All M. A. is conventional in design, as the Mohammedan religion forbade the representation of animal or plant life or human portraiture. Some Mohammedan artists, however, broke away from this tradition, for leaves and flowers are to be found in Persian designs. In miniature painting also and in illuminated MSS. plant, animal, and human forms appear, but never with the same freedom as, for instance, in Chinese paintings. The portrait in M. A. is also conventionalised. Persian paintings are most notable for their combination of line and colour, while in the paintings of India it was as colourists that the Mohammedan artists most excelled. The flower design in Mohammedan ceramics derives from the early Persian period; the colours, design, and glaze of this pottery are extremely harmonious. Examples of M. A. as applied to weapons and armour are found especially in Turkey and Persia. The Turkish helmets were conical-shaped and beautifully engraved with arabesque designs with gold and silver decorations. Owing to the religious restrictions laid upon the arts, calligraphy was always a great source of

is the Quran (Koran), compiled after the death of the prophet, who, as far as we know, wrote nothing himself. The original creed was founded on Mohammed's belief in the one God, a loving Father who rules the universe with mercy; later, God was transformed into a hard, unforgiving despot who demanded the eternal destruction of all unbelievers. The creed is simple: 'There is no God but God, and Mohammed is the apostle of God.' However vile a Muslim may be, he can be saved, and however excellent an unbeliever may be, he must be damned for ever. The teaching of the faithful about women is a grave wrong in so great a faith; it destroys at once the sanctity of marriage and of motherhood, and the purity of the man's home.

Mohammed lifted Arabia from its ignorant worship of degraded gods, and he enforced strict laws of prayer, abstinence from wine, fasting, and cleanliness. The Koran embraces the whole teaching of Islam; the four prn. laws regarding the individual are first, worship, i.e. prayers to Allah five times a day, preferably in a mosque, but otherwise with the face

turned to Mecca; secondly, fasting during the month of Ramadan from sunrise to sunset, including abstinence from smoking as well as food and drink (this month may occur at any season of the year, as the ceremonial year depends on twelve lunations unconnected with the seasons); thirdly, pilgrimage, to travel once at least during a lifetime to Mecca, and perhaps once to Medina; fourth, the giving of alms for the support of the faithful poor. Women are not compelled strictly to observe these laws; those who can are naturally expected to fulfil their duty, but fasts and pilgrimages are not asked of them unless health and circumstances make it possible. Women pray in the mosques apart from the men, closely veiled as the Mohammedan law compels, but they may not lead the prayer, nor is it considered desirable that they should often offer public prayer.

No other sacred book is exactly parallel to the Koran in the influence it exerts over all parts of life, in the intense realization of the unseen, in its promises of future sensual joys, and in the stupendous but absurd claims made for it. The value of its more crude beliefs must not be judged too absolutely, for they are infinitely superior to many pagan systems, and when compared with many of the grossly superstitious faiths which M. supplanted, its doctrines have their positive value. But with the advance of the world M. cannot remain as the final form of religion and ethics for the races which now it sways. 'It hides more than it reveals God, and it makes men virtuous by outward precept rather than out of real love of noble conduct' (J. A. Macculloch, *Religion: its Origin and Forms*). Besides the Koran three other books contain foundations of the faith of Islam, the *Sunna*, or traditional law, the *Ijmaa*, and the *Kias* (*Kiyas*). The *Ijmaa* are authoritative opinions on points of Mohammedan law delivered by those who were actual companions of the prophet. The *Kias* are the argument from analogy to support a legal rule for which there is no direct authority. These four comprise the whole religion of the Moslem.

The fact of the prophet being in possession of Mecca, the Arabian sanctuary, and the promise of a paradise which fulfilled all the material desires of the Arab, aided largely to increase the mass of converts. The prophet left no son, and after his death Abu Bekr succeeded as caliph (successor), or religious head of the Mohammedan empire. Each succeeding caliph was to be a direct lineal descendant of the prophet (see CALIPH). In 654 the third caliph was murdered, and Ali, cousin of Mohammed, and husband of Fatima the prophet's daughter, succeeded as religious head of the empire. This was the beginning of the two great factions in the Moslem church, namely the Sunnites and the Shiites. Orthodox Muslims are known as Sunnites, because they accept the traditional teaching of Mohammed, or Sunna. These traditions, like those of the Jewish rabbis, have grown to an enormous

number, and regulate every detail of life. But even among Sunnites there are seven schools called after their respective founders, who interpreted the Koran and the mass of traditions in different ways. The Shiites reject the Sunna of the orthodox, though they have evolved a Sunna of their own, and in general apply an allegorical method to the Quran. The Sunnites refused the belief of divine succession, and the Shiites regarded the first caliphs as usurpers, and Ali as the divine leader. Ali was murdered; Hassan, his son, took his place and was poisoned by his wife; then Hussein, his youngest brother, succeeded him, and he was slain at Kerbela and buried there; the place has since become a second Mecca to the Shiites. Only one of Hussein's children survived the massacre, named Zayn-el-Abidin, and through him the Orthodox Mussulman Church claims the divine succession. The Shiites flourish chiefly in Persia. The Sunnites and the Shiites are often opposed to one another, both in points of law and in the sanctity of their leaders. The sect of the Wahabis (q.v.) had their origin in Arabia in the eighteenth century, when Mohammed Wahab tried to restore the primitive form of Islam and to remove abuses that had gathered round the faith. An interesting attempt to engraft on M. principles wholly foreign to it is found in Sufism (q.v.) a movement within Islam, rather than a separate sect, having for its purpose a mystical union with God.

At the death of the prophet, the Mohammedan empire consisted of Arabia only, but close on a hundred years afterwards the faithful rushed from the Indus to the Pyrenees, compelling all subjects to accept the faith or die. The grandfather of Charlemagne finally drove them from France (A.D. 732). Egypt and Moslem Asia united and placed their cap. at Bagdad. The Turks (Asiatic people from Turkestan) formed the bodyguard of the caliphs in Bagdad, and becoming stronger than their leaders conquered Asia Minor in 1299; it was then the title of sultan ('victorious') came to be used. The Turks invaded Europe, 1355, and besieged Constantinople in 1356, 1422 and 1453. In which last year they captured it, and it remained their cap. until 1923, when Ankara (now Ankara) was declared the cap. Through the eleventh and twelfth centuries the Moslems gradually spread into India and crossed the Punjab into the Deccan, where the prophet's creed remains one of the prin. faiths of that part of the country to-day. From this brief survey it can be seen how far and wide the teaching of the prophet has been carried; it has borne its fierce followers to win empires, but has not taught them to govern them. The consensus of W. opinion is that the laws of this great faith militate against progress, and destroy the main road to real civilisation; it recognises slavery, and degrades its mothers and daughters, but there is much simple truth and wonderful strength in the creed. See K. H. Becker, *Islam Studien*, 1924 ff.; R. Levy, *An Introduction to the Sociology of*

Islam, 1931-33; A. J. Arberry and R. Landau, *Islam To-day*, 1943; and H. A. R. Gibb, *Mohammedanism*, 1949.

Mohammed Riza Shah Pahlavi (Persian Mohammed Rizā Pālāv) (b. 1919), shah of Persia. He succeeded to the throne in 1941 upon the abdication of his father, Riza Shah Pahlavi.

Mohammed Zahir Shah (Afghan Mōhūmmēd Zā-hēr Shāh) (b. 1914), king of Afghanistan. Succeeded his father, Mohammed Nadir, on the throne in Nov. 1933, on the latter's assassination.

Mohammera, Mohammerah, Muhamrah or Khorramshahr, tn. in the prov. of Khuzistan, Persia, between the Euphrates (Shat-el-Arab) and Karun Rs. It exports wheat, wool, horses, and opium. The tn. has increased in importance since the opening of the Karun canal in 1889. Pop. 30,000.

Moharram, first month of the Mohammedan year, which, consisting of twelve lunar months, contains only 334 days, to which, in what are called intercalary years, one more is added. Thus their New Year's Day falls continually eleven days earlier than in the preceding year. It is a time of mourning for the Shiites, to commemorate the deaths of Hassan and Hussain. In India it is a festival of rejoicing for Shiites, Sunnites, and Hindus, particularly Marathas.

Mohave, Amer. tribe of the Yuman linguistic stock. They inhabit both sides of the Lower and Middle Colorado R., and number a few thousands.

Mohave or Mojave Desert, elevated sandy plateau in San Bernardino co., California, U.S.A.

Mohawk, trib. of the Hudson R. in New York, U.S.A.; it rises in the co. of Oneida, and joins the Hudson a few miles above Troy. Length 160 m.

Mohawks, tribe of Amer. Indians which belonged to the Confederacy of the Five Nations. Their ter. reached from the St. Lawrence down to the Catskills. After the war of Independence they removed to Canada, where they were assigned a location on the Grand R.

Mohawks, or Mohocks, lawless band who infested London about 1711 and 1712. Their practice was to parade the streets of London at night, and under cover of the darkness to commit many outrages upon harmless citizens.

Mohenjo Dara, anct. city of Sind, India, see under INDUS VALLEY CULTURE.

Mohicans (Wolf Indians), branch of the Algonquin stock, who originally inhabited the Hudson valley, but were driven eastward by the Mohawks. They sided with the colonists during the revolutionary war, and are now practically extinct.

Mohilev, see MOGILEV.

Mohl, Hugo von (1805-72), Ger. botanist, brother of Julius von M., b. at Stuttgart in Württemberg. He studied at Tübingen, where he became prof. of botany (1835). It was M. who suggested the name protoplasm for the vegetable cell, the conception of which he clearly defined in 1846, showing the true relationship between the nucleus and the rest of the cellular system (see CELLS). His prin-

work is *Grundzüge der Anatomie und Physiologie der Vegetabilischen Zelle* (1851, Eng. trans., 1852).

Möhler, Johann Adam (1796-1838), Ger. Rom. Catholic theologian, b. at Igersheim, Württemberg. He is principally remembered as the author of *Symbolik oder Darstellung der dogmatischen Gegensätze zwischen dem Katholiken und Protestant* (1832). His miscellaneous works were ed. by Dr. Dollinger (2 vols.), 1839-40. See K. Eschweiler, *Möhlers Kirchenbegriff*, 1930.

Mohmand, powerful Pathan tribe inhabiting the wild mountainous dist. of the N.W. frontier of Pakistan. Once hostile, they are now engaged in trade in the Peshawar valley, and number about 100,000 in Pakistan. See W. S. Churchill, *The Malakand Campaign*, 1898.

Möhne, trib. of the Ruhr R., 43 m. long, in Westphalia, Germany. It rises near Brilon and joins the Ruhr at Neheim. The M. dam in the Arnsbey forest, built 1908-13, was breached by mines dropped by R.A.F. aircraft on May 18, 1943.

Mohooks, see MOHAWKS.

Mohr, Karl Friedrich (1806-79), Ger. physicist, son of a chemist of Koblenz, educated at Heidelberg, Berlin, and Bonn univs. It is claimed by some that he was the first to enunciate the principle of what is now called the conservation of energy. His chief work is *Lehrbuch der chemisch-analytischen Titrirmethode* (1855) and in 1866 he produced his *Geschichte der Erde, eine Geologie auf neuer Grundlage*.

Mohs's Scale, graduated scale of hardness of minerals, based on a classification of ten minerals arranged in such an order that each of them scratches all those below it, but cannot scratch any of those above it. The order is (1) diamond, (2) corundum and sapphire, (3) topaz, (4) quartz, (5) orthoclase, (6) apatite, (7) fluorite, (8) calcite, (9) gypsum, (10) talc.

Mohun, Charles, fourth Baron (c. 1675-1712), son of the third Lord M. by Lady Philippa Annesley, daughter of the first Earl Anglesey. A notorious duellist of violent temperament, he was twice charged with murder, but was acquitted each time. His last duel was with the duke of Hamilton over a quarrel regarding the estates bequeathed to the duke by Charles, second earl of Macclesfield. Both combatants lost their lives, M. by the hand of his adversary and the duke by the treachery of M.'s second, Gen. Macartney. (See Thackeray's *Henry Esmond*.) Having no issue, the barony expired with his death. See J. Burke, *Extinct Baronetcies*, 1835.

Mohur (Persian *mehr*, seal, seal ring), gold coin, originally Persian, used in India from the sixteenth century, and introduced in that country by Akbar, being at first a stamped gold token rather than coin. The M. was legal tender in Brit. India up to about 1860. Its nominal value being 16 rupees in Calcutta and 15 rupees in Bombay and Madras, where it was minted. Its weight was 180 grammes (troy) and it contained 165 grammes of pure gold. There were also

half and quarter gold M_s of proportionate nominal value. In 1499 when a gold standard was established in India the British sovereign was declared legal tender and the M_s was accordingly superseded.

Mordore, Moyodore, Moedor, or Lisbonine, former gold coin of Portugal (*moeda d'ouro*) gold (coin) worth 4800 reis and current in England in the early eighteenth century. Later it was the name used for 27s its approximate value.

Moine, Sir James Macpherson, Le, see Li MOINI

Moine Schists, or Series, thick series of metasedimentary and granulitic gneisses of the Cambrian age which form the greater part of the Scottish Highlands from the Pentland Firth in the N. to the S. edge of the highlands in the dist. of Loch Lomond and from the great overthrust fault on the W. to the Tay valley on the E. They have been variously named by different geologists such as Caledonian gneisses or flaggy schists but the commonly accepted name to-day is the M_s or series so named from the typical, granular gneiss of the M_s Limestone of SW. Sutherland. It is composed of granular quartz felspathic gneiss mainly consisting of grains of equal size of quartz in alkali feldspar.

Moir, David Macbeth (1798-1851) Scottish physician and writer at Musselburgh. He early contributed to Comptes Rendus and Blackwood's magazines often under the pseudonym of 'Delta'. His works include, besides poems, the *Auto-biography of Mansie Buch* (1828-1839) and *Outlines of the Ancient History of Medicine* (1831). The authorship of the Canadian Boat Song is attributed by some to M. See Sir C. Douglas *The Blackwood Group* 1897.

Moiræ, or Parcae, Gk and Lat names respectively for the three goddesses of fate represented by Hebe as the daughters of Nox and Irida. Clotho, the youngest, presides over mortals at the moment of their birth. She is represented with a distaff in her hand and is robed like a weaver in variegated raiment. Inachus is bespangled with stars and always holds a spindle to spin the thread of life and plot futurity. Atropos, the eldest and most inexorable of all, is garbed in black and continually employed in cutting short the thread of man's existence irrespective of age, quality, or sex. Some poets speak of them as all powerful even over Zeus.

Moiré (Lat. *moire* watered silk) now used exclusively to denote watered or clouded silk though the actual process of calendering can be applied to any material, whether woolen and silk stuffs or linen. Formerly the term was interchangeable with mohair (see under Wool). The calendering process whatever the particular fabric used consists in wetting and folding in a particular manner and then subjecting it to hydraulic pressure of about 100 tons between cylinders or rollers. Thus removes the nap, makes the material smooth and imparts a wavy appearance.

Mois, name given by the Annamites

to the uncivilised peoples dwelling in the Indo-Chinese mts. They are called Khas by the Siamese and Penongs by the Cambodians.

Moisewitch, Benno, pianist b. 1890 at Odessa. He was at the Imperial School of Music there and at the age of nine he won the Rubinstein prize. In England since 1908 he was granted his certificate of nationalisation in 1937. He made his debut at Queen's Hall London, in 1909 and gained immediate success. He has travelled extensively giving recitals and gave concerts for Mrs Churchill's Aid to Russia Fund during the Second World War.

Moissac, tn in the dept. of Tarn et Garonne, France, on the Tarn, 15 m NW of Montauban. Standing on the Canal du Midi. M. is a trade centre for wine and wine produce. Pop 7800.

Moissan, Henri (1852-1907), Fr chemist b. in Paris. He became a doctor of science in 1885 prof. of toxicology at the Ecole de l'Institut in 1886 and prof. at the Sorbonne in 1900. He is celebrated for his valuable experiments with fluorine being the first to isolate and liquefy it. He also made some interesting experiments in diamonds and succeeded in manufacturing them artificially. He likewise simplified the production of acetylene gas. His pubs. include *L'Isolation du fluo*, *Reproduction du diamant Carbure de silicium par l'électricité* (1897), *Le fluo et ses emplois* (1900) and articles on mining iron chrome etc.

Moitte, Jean Guillaume (c. 1746-1810), Fr sculptor. His statue of the 'Sacre théâtre' won his election to the Académie des Beaux Arts (1783). He executed the fine bas-relief of the front of the Panthéon, *Le Triumphant entouré des Vertus*, a bas-relief in the Luxembourg vestibule and a bronze equestrian statue of Bonaparte. S. Q. de Quincy 'Eloge' in the *Moniteur* 1810.

Moivre Abraham de see DEMOIVRE ABRAHAM

Mojansk tn in the Moscow Region of the USSR c. 15 m SW of Moscow. It was of considerable strategic importance during the Second World War. The Germans took it in 1941 and made it a strong point and when it was recaptured in Jan 1942 the threat to Moscow was ended.

Mojin, seaport tn of Japan on Kyushu Island. Shimonoseki. It has coal mines. Pop 121 000.

Mokaddasi Shams ed-Din al (Muhammad b. from Jerusalem), b. abt. 946, an Arab (Mohammedan) geographer. He travelled widely and wrote an account of various countries under Moslem rule. See *Description Imperii Moslemici* (de Gouy's ed. in *Bibliotheca Geographorum Islamicorum* in 1877), *Syria and Palestine* (I. Strang's ed. Palestine Pilgrims' Text Society in 1886). See also A. Kremer *Kulturschicht des Orients* II, 1877 and G. Lo Strangi *Palestine under Moslems* 1900.

Mokalla, see MAKALLA.

Mokanna Al (the veiled one) see AL-HAKIM IBN OTTO.

Mokha, *see MOCHA.*

Moko, *see under MAORIS.*

Moksha, riv. of Russia, flowing through the Voronezh and Moscow Regions, a l. b. trib. of the Oka. Length 350 m.

Mokshani, or **Mokshansk**, tn. in the Voronezh Region of the R.S.F.S.R., on the Moksha R. Pop. about 10,000.

Mol, most extensive com. of Belgium, situated 32 m. E. of Antwerp. It has an area of about 14 sq. m. and is engaged in agriculture, cattle breeding, and manufs. of textiles, glass, zinc, and tobacco. Pop. 19,000.

Mola, Emilio (1887-1937), Sp. soldier, b. in Cuba. Chief of the Moroccan forces 1926-31, director-general of the Sp. police 1931-35, he returned to Morocco until dismissed in 1936. When the Civil war broke out he joined Franco, being second-in-command until his death in an air accident.

Mola, Giambattista (1620-61), painter and etcher of It. origin, b. at Besançon. He excelled as a landscape painter, and had a bold and vigorous style. His etchings include 'Judith with the Head of Holofernes,' 'Atalanta,' etc., and he painted 'A Landscape with the History of Hagar and Ishmael.' See L. Lanzi, *History of Painting in Italy*, 1792.

Mola, Pierfrancesco (c. 1620-66), It. painter, b. at Coldre. He is noted chiefly as a landscape painter, but also painted sev. historical pictures. Among his masterpieces are 'St. John in the Desert,' 'History of Joseph,' 'Hercules and Leander,' 'Dido,' 'Landscape with the Temptation of Christ,' etc.

Molainville, Barthélemy d'Herbelot de, *see HERBELOT.*

Molasses, or **Treacle**, by-product of sugar manuf. M. from cane sugar is utilised as human food, M. from beet sugar is bitter and unpleasantly flavoured, though much is used in Germany for mixing with dry food for live-stock as a substitute for roots. In France M. is employed in the production of alcohol. See J. G. Davies, *The Principles of Cane Sugar Manufacture*, 1938.

Molassians, *see EPIRUS.*

Molay (Molai), Jacques de (1228-1314), last of the grand masters of the Templars. Descended from the family of the lords of Longwy and Raon, early in life became attached to the order of the Templars and was sent to the chapel at Beaune. Later, he distinguished himself in Palestine against the infidels. When in Cyprus he was summoned by Pope Clement V. to Paris when all the Templars there were arrested. De Molay was imprisoned and put on trial, but stoutly refused to save his own life by admitting any charges against the order. For this he was condemned to death and burned at the stake. The site of his execution was at the little île de la Seine, at the spot where a statue to Henry IV. was erected. See P. Dupuy, *L'Histoire de la condamnation des Templiers*, 1781; F. J. Raynouard, *Monuments historiques relatifs à la condamnation des chevaliers du Temple et à l'abolition de leur ordre*, 1813; C. G. Addison, *The Knights Templars* (3rd ed.), 1854; H. de

Curzon, *La Régule du Temple*, 1886; M. Lavocat, *Procès des frères et de l'ordre du Temple*, 1888; and Marquis d'Albon, *Cartulaire général de l'ordre du Temple*, 1922.

Molbech, Christian (1783-1857), Dan. lexicographer and historian. He was prof. of hist. and literature at the Copenhagen Univ. (1823-43). His chief works are *Historie om Dithmarskev Krigen* (1813); *Kong Erik Plogpenning's Historie* (1821); *Dansk Ord bog* (1833); *Dansk Dialekt-Lexikon* (1833-41); *Danish Glossary* (1857, 1866); and *Idea of a Scandinavian Union* (1857).

Molbech, Christian Knud Frederik (1821-1888), Dan. poet and playwright, son of the preceding, b. at Copenhagen. His chief poems are *Dighninger* (1845); *Fra Danmarkernes Kar* (1873); and *Efterladte Digte* (1888). Among his plays *Ambrosius* (1878) and *Dante* are the best. He also produced an excellent trans. of the *Dirina Commedia*.

Mold, mrkt. tn. of Flintshire, Wales, 12 m. S.W. of Chester, with limestone quarries and coal and lead mines near. Pop. about 6000.

Moldau, or **Vltava**, riv. of Czechoslovakia, rises in the Bohemian Mts., flows past Prague, and after a course of 270 m. joins the Elbe near Melnik.

Moldavia, N.E. portion of Rumania, formerly one of the Danubian principalities. *See RUMANIA.*

Moldavian S.S.R., constituent republic of the U.S.S.R., formed in 1940 by the union of part of the former M. A.S.S.R., which was formerly included in the Ukraine S.S.R., and areas of Bessarabia with a predominantly M. pop., ceded by Rumania to Russia in 1910. The Black Sea lies to the S., Rumania to the W., and the Ukraine to the N. and E. Agriculture is extensively carried on, the area being famous for fruit and grapes; sugar-beet, maize, and tobacco are amongst other crops. Industries include food conservation, and wood, leather, and textile manufs. Fish are plentiful, including mackerel and sturgeon. Phosphorites, lignite, gypsum, building materials, and possibly oil are to be found. Electric power is supplied from generating plants on the Dniester. Cap. Kishinev. Area 13,200 sq. m. Pop. 2,200,000.

Molé, Mathieu (1584-1656), Fr. magistrate, b. in Paris. He became attorney-general in 1611, and was appointed by Richelieu first president of the parlement (1641-53), becoming keeper of the Great Seal (1651). His *Mémoires* were pub. by the Société de l'Histoire de France (1855). See P. de Pansey, *Éloge*, 1775; also life by Baron A. G. P. de Barante, 1859.

Mole, or *Talpa europaea*, common Brit. burrowing mammal, about 6 in. in length, with a cylindrical body, long pointed muzzle, short tail, broad, powerful five-clawed fore-limbs, and long, narrow hind-limbs. The fur is soft and velvety, and normally greyish black, but frequently of other colours. Although one of the insectivora, the M.'s food is chiefly earth-worms, but insects are eaten in large numbers, and evidence goes to show that a proportion of vegetation forms part of

the dietary. Ms. are very voracious, and are unable to live more than a few hours without food. The nest, with its system of galleries and approaches, is a wonderful work, made usually under banks or among the roots of trees. The M. hills are formed as the animal excavates, and on lawns and pastures they cause disfigurement and inconvenience, but the soil is always rich, for the animal avoids poor land where food is likely to be scarce. Ms. are usually caught by means of spring traps or by nooses fixed on bent twigs and placed in the runs.

Mole, see under PIER.

Melech, or **Molooh**, originally **Melek** (king), was intentionally mispointed in the Heb. on the analogy of 'Coseth' in order to discredit it. The title is found widely spread throughout the Semitic races as a divine name, but in the O.T. it is especially connected with the religion of Ammon, e.g. 1 Kings xii. 7, 'the abomination of the children of Ammon.' The evidence, indeed, seems to show that M., or Milcom (1 Kings xi. 5; 2 Kings xxiii. 13, etc.), was the special tribal god of the Ammonites, standing to them in the same relation as did Chemosh to the Moabites. The particular rite connected with his worship was the sacrifice of children by fire, and it is certain that this practice, though vigorously opposed by the prophets, was also introduced into the worship of Jehovah during the last period of the kingdom (Is. lvii. 5; Jer. xix. 5). Solomon is said to have built a sanctuary to M. at Topheth.

Mole Cricket, orthopterous insect, highly elaborated for a burrowing life in the ground, where, like the mole, it lives on worms and insects. It is from $\frac{1}{2}$ in. to 2 in. long, dark brown, and covered with soft hair. The tibiae of the fore-legs are flattened and terminated much like the fore-legs of the mole. The M. C. retains its power of flight, though it goes above ground only at night. The larvae are white, and mature very slowly.

Molecule, denotes in chem. the smallest particle of an element or compound exhibiting the chemical properties of the individual; any further div. completely alters its properties, so that it gives rise to new products. Most Ms. are ultra-microscopic and are investigated by the indirect methods of physics and chem. It was the study of gases in which Ms. are most free to move that gave rise to the molecular theory. The physical laws common to all gases are Boyle's, Charles's, and Dalton's, whilst Avogadro's hypothesis has been particularly useful in the study of gases (see GAS AND GASES). Based on these is the kinetic theory of gases (*q.v.*), which, briefly, asserts the laws to be due to kinetic energy of Ms. rather than to any potential forces acting between them. The further study of the physical nature of Ms. proceeds in general in the direction of diffusion, viscosity, and internal friction of gases.

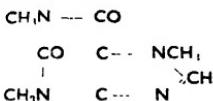
It is in chem. that success has been most attained. Analysis determines the elements of which any substance is composed, and which must be present in the

M. All the Ms. are found to be similarly constituted, and the atomic proportions of elements present are generally easily determined. Thus, analysis shows that methane contains the elements carbon and hydrogen in the proportion of 12 to 4 by weight. Now, if we divide each of these numbers by the atomic weights of carbon and hydrogen respectively (12 and 1), we find that the ratio of the number of atoms of carbon to the number of atoms of hydrogen present in methane is 1 : 4, giving as the simplest or empirical formula CH_4 . Moreover, the hydrogen in methane can be replaced in four stages by the action of chlorine to give the products methyl chloride (CH_3Cl), methyldene chloride (CH_2Cl_2), chloroform (CHCl_3), and finally carbon tetrachloride (CCl_4), indicating that the formula is probably CH_4 and not C_2H_4 , C_3H_8 , etc. The chemist may then proceed to assign proportional molecular weights to substances. These determinations depend on the hypothesis of Avogadro that equal volumes of gases at the same temp. and pressure contain an equal number of Ms., an hypothesis steadily confirmed in the kinetic theory. The chemist adopts the simple formula, or the simplest multiple which allows his reactions. In a very large number of cases, the methods of physics corroborate the simple chemical formula. The molecular weight in grammes of any gas occupies a volume of 22.4 litres at 0 °C. and 760 mm. pressure. To return to methane, one litre of the gas at 0 °C. and 760 mm. weighs 0.717 gm. Thus 22.4 litres would weigh 22.4×0.717 or 16.06 gm. This settles the formula for methane, CH_4 ($\text{C} = 12$, $\text{H} = 1$). The other formula mentioned, e.g. C_2H_8 ($12 \times 2 + 8 \times 1 = 32$), would not fit in at all. It must be remembered that for computing accurate M. weights, the standard taken is $\text{O} = 16$ or $\text{H} = 1.0076$, and that the density determinations merely serve to fix the approximate value. The accurate result is then obtained from analytical data. (In the case of the rare gases, however, density has to be obtained accurately, as analytical data are impossible.) So far the method is limited to gases. Van't Hoff showed that Avogadro's hypothesis may be applied to substances in dilute solution; results may thus be obtained from consideration of osmotic pressure, and its effect on vapour pressure, boiling and freezing point of the solvent. These methods are useful for non-electrolytes like cane sugar, but for electrolytes ionisation complicates matters.

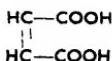
Information as to molecular weight in the liquid state can be obtained from surface tension methods (see PARACHOR, SURFACE TENSION, etc.), but for solids the position is unsatisfactory, and little real information is possible. In crystalline electrolytes each crystal is really an individual M.

A further study by chemists reveals the structure or architecture of the M. itself. Groups of the constituents of Ms. may be removed, and tend to remain associated, indicating possibly a closer or stronger structure of those constituents within the

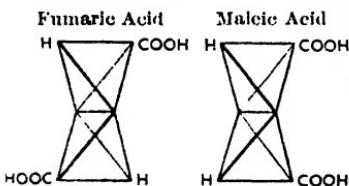
M. Substances show the same elements united to form Ms. of different substances, yet in the same proportion, the Ms. not only presenting different properties but splitting into different groups of atoms in the course of chemical reactions. This, with the aid of the theory of valency (q.v.), enables the chemist to picture the probable architecture of the Ms. These and allied cases occur under the form of isomerism, polymerism, and metamorphism (qq.v.). For example, the M. for caffeine is represented thus:



Van't Hoff examined these structures and propounded geometrical theories. For example, fumaric and maleic acid are both represented by:



Widicusenus explains this difference in properties by geometrical formulæ thus:



The presence in the M. of an asymmetric carbon atom gives rise to the possibility of optical activity, where two Ms. related to each other as the right hand is to the left, are able in solution to rotate the plane of polarisation of light in opposite directions (see OPTICAL ACTIVITY). Many instances are known, and they are not confined to the carbon atom. The actual size of an average M. is of no interest beside its physical structure and chemical properties. It was investigated by Lord Kelvin, who expressed it by stating that if a drop of water were magnified to the size of the earth, its Ms. would be somewhere in size between those of a small shot and a cricket ball. In recent years, however, the study of giant or 'macro'-Ms. has made great advances, and is rapidly becoming a specialised subject. Among substances with macro-Ms. may be mentioned rubber, proteins, natural and artificial fibres, various plastics, and antibodies—possibly also viruses.

Mole-rat (*Spalax* or *Aspalax*), genus of blind rodent quadrupeds of the family Muridae, having teeth almost like those of rats, but in many respects resembling moles. One species inhabits the S. of Russia. Another, found in the Malayan Archipelago, is as large as a rabbit.

Moleschott, Jakob (1822-93), Dutch physiologist and metaphysician, b. at Hertogenbosch. He held the chair of physiology successively at Zürich, Turin, and Rome. In metaphysics he denied any vital principle, regarded life as metabolism between the organic and inorganic worlds, and enclosed his materialism in the formula 'Without matter no force; without force no matter.' His views were developed in *Der Kreislauf des Lebens* (1852). Among his numerous scientific treatises was a *Natural History of Man and Animals* (1855). He wrote a biography of J. G. Förster (q.v.).

Molesey, East and West, two adjacent parishes in the co. of Surrey, on the r. b. of the Thames. Combined pop., 9000.

Moleskin, kind of silk fabric having a thick soft shag similar to the fur of a mole; also a kind of shaggy cotton fabric which is used for workmen's trousers by reason of its good wearing qualities.

Molesworth, Sir William (1810-55), Eng. politician, b. in London. He entered Parliament in 1832. Except during the years 1841-43 he retained seat all his life, and was one of the most prominent 'philosophic radicals.' For many years he controlled the *Westminster Review* with John Stuart Mill. He held the office of secretary of state for the colonies for a few months before his death. It was he more than any other who exposed the evils associated with the transportation of convicts, and he did much to arouse interest in colonial problems generally, placing his wealth and capacity for hard work at the disposal of the colonial reform movement. He favoured greater powers for the colonial legislatures as against the veto of the imperial gov.

Molfetta, seaport of Italy, in the prov. of Bari. It has a cathedral, and its harbour is partly formed by a natural breakwater. Olive oil, wine, nitre, and almonds are exported. Pop. 46,000.

Molière (1622-73), name assumed by Jean Baptiste Poquelin, the greatest comic dramatist of France. He was b. (probably on Jan. 15), in Paris, the son of a rich upholsterer, who was also *ravel de chambre du roi, avec surrurance*, thus M. was born king's *ravel de chambre* presumptive. His father gave him the education of a gentleman, first at the Collège de Clermont (now the Lycée Louis le Grand), where he was the schoolfellow of the prince de Conti, and then, as one of a group of gentlemen's sons, he followed a course of instruction under the celebrated philosopher and astronomer, Gassendi. From 1643 to 1647 he studied law at the univ. of Orléans. But the career of lawyer was not congenial to Jean Poquelin, while the theatre attracted him irresistibly, though he was even more attracted by a particular actress, Madeleine Béjart, who, later, returned his love. As a Parisian he must often have witnessed the popular burlesques and farces of Turlupin, Gros-Guillaume, Gautier-Gargouille, the Goguenins, the Tabarin, and the Rodomonts on the Pont-Neuf, in the Place Dauphiné, and at the fairs, as well as the farces, which had begun to be much more popular than

pastorals and tragedies, performed at the Hôtel de Bourgogne. For people had come to wish 'to be made to laugh for their money,' and Corneille was losing power. Poquelin, with Madeleine Béjart's co-operation, got together a little troupe, founded the 'Illustre Théâtre' (merely a grandiloquent name for a company which opened in a converted tennis-court), and took the name of Molière. After a few months of struggle and want in Paris, the company ended in bankruptcy. M. was jailed for debt, but his father bailed him out and provided sums totalling nearly 2000 livres, which, in sum,



MOLIÈRE

Engraving after the original picture of the school of Lebrun in the Musée Royal, Paris.

prosperous times, were duly repaid. Undaunted, M. and his troupe left Paris for the provs., and for the next twelve or thirteen years they went from tn. to tn. playing. M. led a very strenuous life, for he was not only the manager of the troupe, and an actor, but the adaptor of the plays they represented and, soon, an author himself. At first he wrote farces after the orthodox It. type, with its stock characters. Some of these he afterwards recast, and developed into real comedies, as, for instance, *Le Fagotier*, which became *Le Médecin malgré lui*, *Gorgibus dans le sac*, which became *Les Fourberies de Scapin*, and *La Jalousie du Barbouillé*, the later *George Dandin*. Two works of comedy proper mark this period, *L'Élourdi* and *Le Dépit amoureux*. With the help of a reputation won in the provs., and the patronage of the prince de Conti, who introduced him through Monsieur, the king's brother, to the king and queen, M. launched his troupe in Paris under the title 'Troupe de Monsieur.'

In 1658 his company acted Corneille's

turgid tragedy *Nicomède* in the old guard-room of the Louvre before the youthful Louis XIV., but the reception was tepid, largely because M. thought that the characters, though they were kings and queens, should use the diction of people in real life. But M. saved the situation with his now vanished farce, *Le Docteur amoureux*. As *pièce de début* before the Parisian public he gave *Les Précieuses ridicules* (1659), the first satire on Fr. cultivated society, or, more strictly, on would-be cultivated society, especially as seen in the provs., and this performance taught M. his true medium of dramatic expression. Its truthfulness to life, its gaiety and good humour, secured for M. the public favour for ever. It may be noted here that when the guard-room of the Louvre was pulled down to effect improvements to the Louvre, M.'s troupe moved to Richelieu's theatre in the Palais Royal, where they remained until his death. They subsequently amalgamated with their rivals, the Hôtel de Bourgogne, and so formed a company which, housed in different premises at various times, has preserved throughout the historic name of the Comédie Française.

Comedy after comedy followed with remarkable rapidity for thirteen years. M. endeavoured to bring comedy up to the standard of tragedy, even to surpass it if possible, but he was obliged for financial reasons to provide also conventional and extravagant farces and, to satisfy the taste of the court, operatic comedies or comedy-ballets, such as *Les Fâcheux*, in which the words are only a pretext for music and dancing. *Sganarelle, ou le Cœu imaginaire*, was produced in 1660; *Don Garcia de Navarre*, an unsuccessful tragedy, in 1661; *L'École des maris* (suggested by a comedy of Terence), and *Les Fâcheux*, both highly successful, also in 1661. Sganarelle, who figures with varying characteristics in many of M.'s plays, is a laughable figure in *L'École des maris* and, what is more important, emerges for the first time in Fr. comedy, as a character completely rounded off. *L'École des femmes*, in which, as in *L'École des maris*, M. shows what happens when people's natural tendencies are ignored, was a brilliant success, but it brought upon its author those jealousies and bitter attacks which were to pursue him to the end of his life. These attacks he replied to (1663) in the mordant *Critique de l'École des femmes* and *L'Impromptu de Versailles*. The first-named of these pieces is important as an expression of M.'s own views on the true use of rules and the whole duty of a dramatist.

In 1664 *Le Mariage forcé*, *La Princesse d'Élide*, and the first three acts of *Tartuffe* were performed. *Tartuffe* was an attack upon hypocrisy in religion, as it may come to flourish in the house of a bourgeois dérol. But the religious community, Jesuits and Jansenists alike, feared the satire was, or would be thought to be, of more general application, and they prevailed upon Louis XIV. to suppress it. M.'s enemies redoubled their attacks. Only after five years was the whole play

authorised and played with extraordinary success (1669). *Don Juan* (1665) was another play in which hypocrisy was attacked; in *L'Amour médecin*, *Le Médecin malgré lui*, and *Le Malade imaginaire*, the doctors of the day are pilloried and quackery exposed; sincerity and coquetry come to close quarters in *Le Misanthrope*; the mortifications of the man who marries into a superior social rank are depicted in *George Dandin*; *L'Arabe* shows that distrust comes to be the essential characteristic of the miser, and the immortal *Bourgeois Gentilhomme* makes fun of the *bourgeois* who would quit his native sphere and become a *gentilhomme*. As in other 'command' plays, M. introduced the ballet into this piece, but whereas previously the ballet had been only an interlude, here it was ingeniously worked into the play itself.

The man M. was kind, gentle, affectionate, and magnanimous, beloved of his troupe, very charitable, and always ready to help others. If at times he became bitter and irritable, it was only when he was smarting under the cruel attacks of his enemies and feeling at the same time the pressure of his most strenuous life. He married Armande Béjart, a *comédienne* of his troupe and a coquette; with her he led a very unhappy domestic life. The venomous tongue of Montfleury of the *Hôtel de Bourgogne* suggested that Armande was not the younger sister but the daughter of Madeleine Béjart, but the king did his utmost to rebut the calumny by standing godfather to M.'s child. It seems conceivable that Armande was an illegitimate child of Madeleine by a certain chevalier de Modène, but it is far more probable that she was her sister. That the union was unhappy is undeniable, but Armande was more than twenty years younger than M. and her temperament utterly different.

M.'s art marked an epoch in the development of the Fr. drama; it brought about a new dramatic ideal. The ideal hero of classic tragedy gave place in M.'s comedies to the real man with all his foibles and his duality of character—'On peut être intelligent en son entendement et sot en son caractère.' M. shows the man in his surroundings, not more or less detached from them as was the classic hero, and thus incidentally throws a clear light on the whole group to which he belongs. His chief aim seems to have been to amuse by depicting things as they actually were, in strict truthfulness to life. Whether he had the deliberate moral aim to cure men of their foibles and vices is a moot point. The many opinions expressed by M. which seem to show that he had this aim should, according to Faguet, be looked upon as constituting his *apologie* rather than his set purpose. There is little room for sympathy in the amusement evoked by M.'s characters; the laughter they cause is the critical laughter of the intelligence—Gallic laughter, that of Bergson's book on the subject. 'L'euro est un jugement' may be said of M.'s audience, a point in which it differs from that of Shakespeare. M. set

the fashion for Fr. comic writers after him, but his influence extended far beyond his own country. 'Accuracy of observation, sincerity of purpose, facility of style, abundance of wit, deep humanity, and solid good sense were his greatest gifts. He wrote for his own age, but his appeal is universal' (Scarlyn Wilson). See lives by H. M. Trollope, 1905; H. C. Chatfield-Taylor, 1906; A. A. Tilley, 1921; and J. Palmer, 1930; and an interesting study by E. Faguet in *Etudes littéraires, XVII^e siècle*, 1887. See also H. Davignon, *Molière et la vie*, 1904; P. Kohler, *L'Esprit classique et la comédie*, 1925; and M. Turnell, *The Classical Moment*, 1947. There is a trans. of his *Comedies* in Everyman's Library.

Molina, Luis (1535–1600), Sp. Jesuit, whom Pascal's *Lettres provinciales* have rendered memorable, b. at Cuenca, in New Castle. He entered the Jesuit order at an early age, and for some time taught theology at the college of Colunbra in Portugal. Later, he was appointed prof. of theology at Evora in Portugal, and remained there twenty years, then returning to Spain. Shortly before his death he was appointed prof. of theology in Madrid. His chief work is his *Concordia Libert. Arbitrii cum Gratia Domini*, pub. 1588. He also wrote commentaries on the first part of the *Summa* of Aquinas, and *De Justitia et Jure*. M.'s doctrine is an attempt to reconcile the free will of man with predestination, and gave rise to protracted disputes with the Thomist school of theology, headed by the Dominicans. To-day Molinism is either abandoned or much modified by the chief Jesuit theologians. See F. Stegmüller, *Geschichte des Molinismus*, 1935.

Molinins, see MOULINS.

Molinari, Stefano, se^r MULINARI.

Moline, city of Rock Is. co., Illinois, U.S.A., on the Mississippi R., 4 m. from Davenport, Iowa, on the opposite bank. There are iron foundries, steel works, mills, machine shops, and manufs. of ploughs, pumps, scales, wagons, etc. Pop. 34,600.

Molinia, genus of grasses common on damp moors. The long stiff stems of *M. carulea* are gathered and sold for form cleaning tobacco pipes. A variegated is grown in the garden as an edging plant.

Molinier, Guillem, Provencal poet and prose writer of the fourteenth century. He took a prominent part in the foundation and administration of the literary academy of Toulouse in 1324, and was nominated chancellor. He wrote a treatise entitled *Les Leys d'Amors*, invaluable as a guide to young poets and for the knowledge of troubadour poetry contained therein. This work was pub. by Gatien-Arnoult in 1841–43 and trans. by d'Arquillat and d'Esconlioure.

Molinos, Miguel de (1640–c. 1696), Sp. mystic and ascetic, b. of noble parents at Patacina, Aragon. He was ordained priest, and went to Rome in 1669, where he became acquainted with many distinguished people. In 1675 he pub. his *Spiritual Guide*, an ascetical treatise which roused the antagonism of the Jesuits.

Moliique, *James Allan* (b. 1905), Brit. airman, b. in Glasgow. He served for some years in the R.A.F. and in 1931 he flew from Australia to England in eight days, 14 hrs. 25 min.; in 1932, from Croydon to the Cape in four days 12 hrs. 30 min. In the same year he flew the N. Atlantic from Ireland to New Brunswick in 30 hrs. 15 min.; and also flew the Atlantic to Brazil. In Oct. 1936, he beat the Atlantic crossing record by flying from Harbour Grace, Newfoundland, to Croydon in 13 hrs. 16 min. He married the famous airwoman Amy Johnson (q.v.) in 1932.

Moliique, Wilhelm Bernhard (1802-69), Ger. violinist and composer, b. at Nuremberg. He was director of the royal band at Stuttgart from 1826 to 1849. Some of his compositions, in particular his violin concertos, are still in use.

Mollah, Mullah, Mowla, or Muhsa (Arab. *mawla*), title of respect given among Mohammedans to one learned in theology and law, and to other prominent personages. It is especially used for one of the higher order of Turkish judges, who expounds both civil and criminal law and the religion of the state. Beneath him is the cadi who administers the law. In Somaliland leaders called 'Mad Mullahs' have on sev. occasions raised rebellions. See SOMALILAND, BRITISH.

Mollendo, port of Peru, S. America, in the dept. of Arequipa. It is the terminus of the S. railway, and the port of the city of Arequipa, from wch it is 107 m. distant. It is one of the chief gates for Bolivian exports and imports (another being the new port of Matarani). Its roadstead, however, is an open one and exposed to storms. The prin. export is wool. Pop. 15,000.

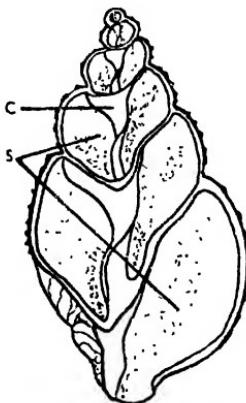
Möller, Peter Ludwig (1814-65), Dan. poet and critic, b. at Aalborg. He wrote *Lyric Poems* (1840); *Lovfald* (The Fall of the Leaves) (1855), and the critical work entitled *Det nyere Lystspil i Frankrig og Danmark* (1858).

Möller, Poul Martin (1791-1838), Dan. writer, b. near Veile, son of a par. priest who subsequently became a bishop. After studying theology and being ordained he visited China as a ship's chaplain (1819) during the voyage writing his poem *Glaede over Danmark*. In 1828 he became prof. of philosophy at Christiansia; prof. extraordinary at Copenhagen (1830). His works include the romance, *En dansk Students Eventyr* (1824) and also the play, *Eyvind Skaldaspiller*. His *Efterladte Skrifter* appeared in 1839-1856. See also collected works, ed. by F. E. Olsen, 1848-50, and V. R. A. Andersen, 1896. See *Poul Martin Möller* by F. V. V. Rønning, 1893, and V. Andersen, 1895, 1896.

Mollison, James Allan (b. 1905), Brit. airman, b. in Glasgow. He served for some years in the R.A.F. and in 1931 he flew from Australia to England in eight days, 14 hrs. 25 min.; in 1932, from Croydon to the Cape in four days 12 hrs. 30 min. In the same year he flew the N. Atlantic from Ireland to New Brunswick in 30 hrs. 15 min.; and also flew the Atlantic to Brazil. In Oct. 1936, he beat the Atlantic crossing record by flying from Harbour Grace, Newfoundland, to Croydon in 13 hrs. 16 min. He married the famous airwoman Amy Johnson (q.v.) in 1932.

Molluscs (*Mollusca*) or **Shell Fish**, constitute one of the chief divs. (phyla) of the animal kingdom, and were evolved at a very remote period in its hist. The great majority live in the sea, some of them at very low depths (a few below 2,900 fathoms); others occur in shallow water, and many above low-tide mark. A considerable proportion inhabit rvs. and lakes, and very large numbers have adapted themselves to a terrestrial life, some even contriving to exist in deserts, though most terrestrial M. are very dependent on moisture. The dict is much varied; carnivorous M. prey chiefly upon other members of the phylum. Many feed exclusively on minute lowly organisms, and others are entirely vegetarian. A few M. have long been valued as food, or as bait for other animals, some yield dyes (e.g. *Murex*, formerly used as a source of Tyrian purple) and others secrete pearls and pearly shells which have been and are employed for great diversity of ornament. The modern systematic arrangement of M. is in five classes, as follows: Class 1, *Amphineura*, comprises two orders. The first, *Polyplacophora* or *Isoplectura*, includes the coat-of-mail-shells, or sea woodlice (*Chiton*). These differ in many respects from other M., having points in common with crustaceans and annelids, but after investigation of their life hist., there is no doubt as to their association with M. The other order, *Aplacophora* or *Solenogastres*, includes a few worm-like creatures which, instead of a shell, bear on the dorsal surface minute calcareous spines. Class 2, *Gastropoda*, is divided into two sections: *Streptoneura* (with a twisted nerve loop), the members of which are bisexual, furnished with a shell and generally with an operculum; and *Euthyneura* (in which the visceral loop is untwisted), which are hermaphrodite M., scarcely any with an operculum in the adult state. The first section contains two orders, *Aspidobranchia* or *Diotocardia*, of which the limpets, top-shells, and ear-shells are typical, and *Pectinibranchia*, typified by rock snails, whelks, harp shells, cones, wing shells and periwinkles. The first order (*Opisthobranchia*) of the other section are all marine, e.g. bubble shells, sea hares, and umbrella shells. The second order (*Pulmonata*) comprises the true snails, and slugs, and the false limpets. Class 3, *Scaphopoda*, includes only the tooth shells (*Dentaliidae*), which are a very distinct group of sand burrowers, tubular shells resembling the tubes constructed by some marine worms. Class 4, *Lamellibranchia*, or *Pelecypoda*, comprises the bivalves. All the members of this class, unlike other M., have no head, nor cephalic eyes, nor jaws or tongue. All are aquatic and most of them marine. They are classified in four orders: (i.) *Protobranchia* (e.g. *Nucula*), (ii.) *Filiibranchia* (e.g. common mussel, pearl oyster, scallops), (iii.) *Eulamellibranchia* (e.g. freshwater mussel, cockle, razor shell, oyster, shipworms), (iv.) *Septibranchia* (e.g. *Poromya*). Class 5, *Cephalopoda*, is arranged in two sub-classes, *Tetrabranchia*

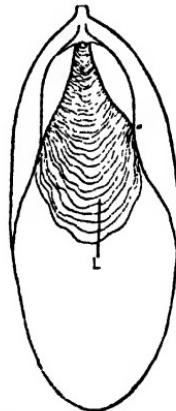
and Dibranchia. Of the former, the pearly nautilus is the solitary living example, but with it have been classified all the oldest fossil forms (the Ammonites). *Nautilus* itself has been found in the



HALF SHELL OF WHELK

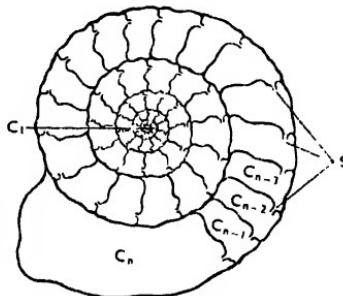
C, columella; S, spiral cavity inhabited by whelk.

oldest Paleozoic formations. It differs from all other Cephalopods in having four instead of two gills, and a number of small retractile feelers instead of eight or ten arms with suckers or hooks. The

INTERNAL SHELL OF CUTTLEFISH
(*Sepia*)
L, laminae.

sub-class Dibranchia consists of two orders: (i.) the Ostopoda, in which are the octopus, the argonaut and other forms with eight similar arms; (ii.) the Decapoda, including the squids, cuttlefish and other M. with eight similar arms and two longer ones that can be retracted. In all

cases, M. reproduce by means of eggs, but in the freshwater snails (*Vivipara*), and other instances, the young are hatched within the parent's oviduct. Some bivalves produce eggs in enormous numbers, e.g. the common oyster, a million or more, and the Amer. oyster, ten or fifty times as many. Terrestrial M., on the other hand, deposit very few eggs, and these are enveloped, in some cases, in a gelatinous mass, in others, in a thin soft skin, and in a few are protected by a hardened calcareous shell. Many M. deposit their ova in capsules (e.g., common whelk), others produce them in spiral ribbonlike structures. The ova of most M. develop into free-swimming larvae (*Trochophore* and *Veliger*), but in a few cases there is no metamorphosis. No mollusc has an internal body skeleton, and hence their name, from the Lat. *mollis*, soft. In most of them the external shell, which is

SURFACE OF SECTION OF AMMONITE
(FOSSIL SHELL)

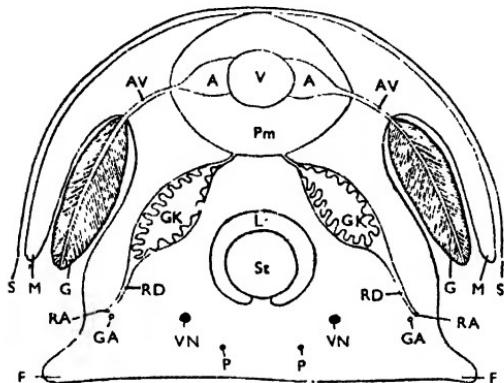
C₁—C_{n-3}—C_n. Chambers successively occupied as growth proceeded.

S. Siphuncle, through this passed an organic cord connecting the first chamber, C₁, with the visceral hump in the last chamber, C_n.

secreted by the mantle or outer covering, affords adequate protection. In the shell, a vast variety of structures and arrangement occurs, but it is of minor importance to systematic zoologists compared with the structural features of the animal. The shell may be single as in the limpet and snail, or be formed of two valves as in the mussel or oyster, or it may consist of a series of plates as in the Chitons. In the squid it is quite internal, and from a number of M. it is altogether absent. The foot is a modification of the ventral surface, and in the Cephalopods part of it is elaborated into the so-called arms, the other part forming a funnel through which water is ejected to cause the animal to move in the opposite direction. In the cockles it is evolved for leaping, in the limpet for clinging, in the razor shells for burrowing, and in the pond snails for gliding. The operculum is the flat hard structure with which the snail closes its shell. It also is subject to much elaboration. Breathing is accomplished in aquatic

forms by means of gills, the ctenidia, which show a variety of form and arrangement in the different orders. In most M. the mantle, which secretes and lines the shell, is folded in such a way that it encloses part of the vascular system, and in aquatic forms the gills also are enclosed within the mantle cavity. In land M. the cavity forms an air chamber, sometimes termed a lung, with an opening through which air is inhaled and exhaled at very irregular intervals. This arrangement facilitates the interchange of gases between the vascular system and the air. *Eustacea*, a Brazilian mollusc, has a gill, and a respiratory chamber, and is thus intermediate between wholly aquatic and terrestrial M. Some M. have paired gills; others have a single gill. The octopus

upper surface is covered with spiny outgrowths, and with this the limpet rasps the rocks for food, and carnivorous M. penetrate the shells of other M. From complete absence in some species to the wonderful eye of the cuttle, organs of vision are to be found in all stages of development. A sense of hearing, and also a sense of smell, are undoubtedly present in the more highly specialised M. As an instance of the tenacity of life in many M., a desert snail in the Brit. Museum was found to be alive after having been fixed to a tablet for four years, where, of course, it could not obtain food or water. See J. Sowerby, *English Botany*, 1790-1814; *The Cambridge Natural History*, vol. iii., 1895-1909; A. H. Cooke, *Molluscs, Brachiopoda*, 1895; Sir E. R.



SCHEMATIC TRANSVERSE SECTION OF A BILATERAL MOLLUSCO

The structure of all Molluscs may be considered as derived by modification of such an arrangement.

and cuttlefish have one pair, *Nautilus* two pairs, and *Chiton* many pairs of gills. Considerable variation occurs in the form of the gills; some are filamentous, others are formed of a series of thin, overlapping plates or leaves, others are reduced to a single septum. In the Scaphopoda there are no special breathing organs, but exchange of gases takes place over the whole surface.

The vascular system, too, shows great differences in development in various M. In some, the heart is very reduced; in others, a single auricle and ventricle are present, whereas in others there are two auricles and a ventricle. Forms with the best developed vascular systems have occasional sinuses or spaces into which the walls of the blood vessels do not extend. Blood flows through the sinuses and into other vessels. In poorly developed vascular systems of certain M. the actual vessels are comparatively short, and the blood passes into an extensive haemocoel. The odontophore or radula, which occurs in all M. except the Lamellibranchs, is a remarkable structure; its

Lankester, *Mollusca*, 1906; Ida Colthurst, *Shells of the Tropical Seas*, 1938; Rossallie Lulham, *Introduction to Zoology*, 1923; E. A. Ellis, *British Snails*, 1926; E. Step. Shell Life: an Introduction to British Mollusca, 1927; O. B. Böggild, *Shell Structure*, 1930; L. A. Borradaile and F. A. Potts, *The Invertebrates* (2nd ed.), 1935; and A. H. Verrill, *Strange Sea Shells*, 1936.

Moltwitz, vii. of Silesia, 3m. W. of Brieg. Frederick the Great routed the Austrians under Neipperg here in 1741. Frederick's own share in the victory was negligible, for when his cavalry, under Schülemburg, were hurled from the field by Romer, the Austrian cavalry leader, Frederick, who was involved in their rout, fled from the field of battle. It was the Prussian infantry under Schwerin who won the victory by their steadiness and rapid fire.

Molly Maguires, name of a Ribbon society which flourished in Ireland between 1835 and 1855, and harassed the landlords and their supporters. It was also the name of a more notorious Irish secret society which terrorised the coal dists. of Pennsylvania, U.S.A., for some

fifteen years before 1877. In that year many of the ringleaders were convicted and hanged, and the society was broken up.

Moloch, see MOLECH.

Molodechno, Region of the Byelo-Russian S.S.R., in the N.W. of the republic. The tn. of M. is the cap.

Molotov, Vyacheslav Mikhailovich (b. 1890), Russian statesman, b. at Kukardi in the government of Viatka, his real name being Skryabin. He was a political writer before joining the Bolshevik party, or the predecessors of that party, in 1907. He assumed the name of M. in 1909. Prominent in the October revolution of 1917, he was then as closely associated with Lenin, as, later, he was with Stalin. Becoming secretary of the Central committee of the Communist party in the Ukraine, 1920, and of the Central party, U.S.S.R., 1921, he acquired much influence in the executive and legislative powers of the Soviet. A member of the all-powerful political bureau of the Communist party in 1924, he was appointed president of the council of peoples commissars of the U.S.S.R. in 1930, in which capacity he introduced the amended Russian constitution, which came into operation in 1937. M. succeeded Litvinov (q.v.) as commissar for foreign affairs in 1939, still retaining the presidency of the people's council. He played a leading part in the conclusion of the Soviet-Ger. non-aggression pact of Aug. 1939, which he declared had 'put an end to the abnormal relations that had existed for a number of years between Russia and Germany.' In this statement, made on Oct. 31, he hinted that 'the ruling classes of Great Britain and France wanted to drag Russia back to the Middle Ages, to the days of religious wars, superstition and cultural deterioration.' Yet in fact M., conformably with his instructions from the Kremlin, was playing a double game—conducting tentative and secret conversations with Ribbentrop while Moscow, in reply to the Brit. and Fr. request to underwrite their guarantees to Poland and Rumania, was asking for a triple alliance of mutual assistance. Chamberlain hesitated, thinking such a step might precipitate rather than delay war. Moscow grew tired of waiting and M.—who had in the meantime succeeded Litvinov as foreign commissar—on May 20 (1939) told the Ger. ambas. that Russia would reopen trade talks with Germany, though only if 'the necessary political bases' had been constructed. Ribbentrop, in pursuance of Hitler's intention to clear the way at all costs for an attack on Poland, replied that he was ready for such a pact. In the sequel, following the speed of the Ger. conquest of Poland, Moscow demanded bases in the Baltic states and Germany was acquiescent. In the next few months large quantities of food and oil were sent regularly to Germany under the pact and Russia also let supplies pass through to Germany from other countries, thus weakening the allied blockade; in return Russia received much-needed manufac-

tured goods and war material. But thereafter both nations grew ever more suspicious of the other's real intentions, and late in 1940 M. was protesting to Ribbentrop that he had violated the pact by giving Transylvania to Hungary and guaranteeing the rest of Rumanian ter. against any aggression (see on this the Ger. documents on Nazi-Soviet dealings pub. after the war by the U.S. State Dept.). In 1940 M. reaffirmed Russian neutrality, when he sought to justify the extension of the Soviet frontiers westward by the incorporation of the Baltic states and Bessarabia. In June 1941, in a broadcast following the Ger. invasion of Russia, he described the attack as 'without example in the hist. of civilised nations.' In the same month he visited London and concluded an Anglo-Russian treaty of military alliance and post-war collaboration; and, at President Roosevelt's invitation, he visited Washington. After the war he represented Russia at conferences of foreign ministers in Paris and at the United Nations. In 1949 he was succeeded as minister of foreign affairs by Vyshinsky, who had represented Russia at the meetings of the United Nations' Security Council.

Throughout his career M. has been the cool and business-like revolutionary, a born chief-of-staff, as Stalin recognised. Through all the changes, troubles, and purges he held his position, an opponent of all attempts at amelioration of the official Soviet policy as enunciated by Lenin and Stalin. Latterly his work was to extend and consolidate and defend the revolution in face of the chaos which he believes will accompany an inevitable breakdown of W. civilisation. In a Russia noted for untidiness he stood for precision and order. With an infinite capacity for unwearyed and tenacious organisation, backed by unwavering and fanatical devotion to Stalin, to Russia, and to Communism, he wore down his opponents by the sheer force of tedium, and achieved a place second only to Stalin.

Molotov: 1. Region of the R.S.F.S.R. in the central Urals, on both sides of the Kama R., producing copper, potash, etc., and having iron industries. Pop. 2,082,000. 2. Formerly Perm. Cap. of the above, formerly cap. of the old prov. of Perm. It is situated on the R. Kama, near the point where the R. Chusovaya flows into it, 210 m. N.W. of Sverdlovsk. It has a univ., founded before the revolution. It was the see of a bishop until the disestablishment of the Church in 1918, and has a cathedral. M. is an important riv. port for reloading the Siberian grain and metals from the Urals from the railway for shipment down the Kama, and for loading the oil and manufactured goods which come down the Kama on to the railway. The shipping of timber, the timber industry, flour mills, and leather works are the chief activities of this city, and the metal works near by, at Motovilikh, are also a big industrial concern. Copper was discovered in the seventeenth century. Other industries are the build-

ing of ships for riv. traffic, the manuf. of phosphatic fertilisers, and non-ferrous metallurgy. Before the First World War the pop. was 63,000; to-day it is upwards of 255,000.

Molteno, Sir John Charles (1814-86), S. African statesman, of Milanese extraction, b. in London. In 1831 he sailed for S. Africa, in 1854 became first member for Beaufort in the legislative assembly, and in 1872 was appointed first Cape Premier. In 1878 he retired from public life, being opposed in every respect to Sir Bartle Frere's policy. *The Life and Times of Sir J. C. Molteno* by his son, Percy A. M., gives an account of the Cape colonists' struggle to obtain a liberal and workable constitution.

Moltke, Adam Gottlob, Count von (1710-1792), court marshal and privy councillor to the Dan. king, Frederick V., over whom he exercised great influence. While he was averse from liberating the serfs, he introduced considerable scientific improvements into Dan. agriculture. His *Memoirs*, pub. in Ger. in 1870, are valued as record of his times. See H. H. Langhorn, *Historische Nachricht über die dänischen Moltkes*, 1871. His grandson, Count Adam Wilhelm von M. (1785-1864), headed the democratic ministry which introduced the constitution of June, 1849.

Moltke, Helmuth Carl Bernhard, Baron von (1800-91), Prussian general and statesman, b. at Parchim, son of a Dan. general. In 1822 he left the Dan. for the Prussian military service, becoming staff-major in 1832. In 1839 he took part in the Syrian campaign as adviser to the Turkish commander-in-chief. Becoming chief of the general staff in 1849, he took an important part in the conduct of operations in the Dan. war (1861) and in the subsequent peace negotiations. He was sent to Florence in Feb. 1866 to negotiate an alliance with Italy against Austria. In the ensuing war with Austria he again displayed astounding precision and rapidity in formulating the general plan of campaign. With the Prussian king he defeated the Austrians at Sadowa (1866). His foresight had much to do with the success of Germany in the Franco-Ger. war of 1871, the details of the plan of campaign being prepared by him as early as the winter of 1867. He concentrated his armies on Metz with extreme caution, and in less than three weeks actually reached the walls of Paris. On his return to Prussia M. was created field-marshall. In 1873 M., with Baryatinski and the emperors of Germany and Russia, signed a treaty with Russia, a treaty ominous of the growing importance of Germany in the constellation of powers. M. pub. many works, among which were *The Italian Campaign of 1859; The Franco-German War* (1872); and *The German Army* (1871).

Moltke, Helmuth Johannes Ludwig von (1848-1916), Ger. general, native of Gersdorff, Mecklenburg, son of a minor Prussian official, and nephew of the famous F.-M. von M. A lieutenant in the campaign of 1870, in 1882 he became personal aide-de-camp to his uncle, on

whose death in 1891 he became aide to the emperor. Major-general, 1899, he was promoted lieutenant-general, 1902, with command of an infantry div. of Prussian Guards. Chief of general staff from 1906, in 1914 he was superseded by Falkenhayn and became deputy-chief.

Moluccas, or Spice Islands, sev. groups of is. of the Malay Archipelago, lying between New Guinea and Celebes, belonging to the Dutch. They include Ternate and Halmahera; Buru and Ceram (in the Amboyna group); the Banda Is.; Timor-Laut, Larat, and other of the S.E. Is.; and the Bacchian, Obi, Kel, Aru, Babar, Leti, and Wetar groups. The M. are mountainous and volcanic, and the soil is very fertile, the chief products of commerce being all kinds of spices, sago, rice, and coffee. The climate is fairly healthy, though hot and moist. Amboyna is the chief tn. and most important commercial centre. The inhab. of the M. are mainly Polynesians, Papuans, and Malayans.

The Eng. were in possession of the M. in the early seventeenth century, when there were frequent battles with the Dutch; but later in that century the Dutch, by securing their base in Java, became masters of the archipelago. Van Diemen, having conquered Ceylon, isolated Malacca, with the result that the M. fell to the Dutch in 1642. According to Raffles (q.v.) desolation and ruin tracked the steps of the Dutch power, and in the outer is., especially in the M. and Celebes, his summary condemnation was not unmerited. Amboyna was occupied by the Jap. in Feb. 1942, but the is. reverted to the Dutch in 1945. In 1946 they were recognised as part of the new state of E. Indonesia (q.v.). The area of Amboyna is 75,000 sq. m., and pop. 401,000; Ternate 115,900 sq. m., pop. 191,000. See H. M. Tomlinson, *Tidemarks*, 1921; J. Verken, *Moluccas—Reise, 1897-12*, 1930; J. J. Saar *Reise an Banda, 1814-60*, 1930; and R. H. Goffon, *Pageant of the Spice Islands*, 1936.

Moluccella, genus of hardy and half-hardy annuals (family Labiate), with flowers in axillary whorls. *M. levis*, Molucca balm, is grown in the garden.

Molybdenum (symbol Mo, atomic number 42, atomic weight 95.95, first obtained in the metallic state by Hjelm, 1782), a silvery-white, brittle metal, occurs in the mineral molybdenite, MoS_2 , the disulphide of M., which resembles graphite in appearance, but which can be distinguished from it by the green tinge which it gives to the Bunsen flame. It also occurs in wulfenite, PbMoO_4 , or lead molybdate, and in a rare form as M. ochre, MoO_3 , the most important of the three oxides of M. The metal is obtained by heating the oxide with charcoal, or in a current of hydrogen, or by heating with aluminium. Molybdenite when roasted oxidises form the oxide, which is soluble in ammonia, forming ammonium molybdate, a reagent used to test for phosphates. M. is used in the production of high-speed steels; 90 per cent of the global production of M. comes from the U.S.A.

Molyneux, William (1656-98), Irish mathematician and philosophical writer, b. in Dublin. A fellow of the Royal Society, and at one time president of the Dublin Philosophical Society, he was returned to the Irish Parliament in 1692, and created a stir by his plea for the legislative independence of his country in *The Case for Ireland* (1698). He wrote the first Eng. treatise on optics, *Dioptrica Nova* (1692), a subject suggested, perhaps, by his wife's tragic loss of sight.

Molyneux River, see CLUTHA.

Molza, Francesco Maria (1489-1544), It. poet, b. at Modena. There he married, but most of his years were spent free from domestic tie at Rome and at Bologna, amid a brilliant and admiring literary band. His *Ninfa Tiberina* has been described as a glowing pastoral mosaic, but most of his poetry seems but a frigid, if finished, paraphrase of Gk. and Lat. verse. Edmund Gardner, however, speaks of his 'noble sonnets' on the sack of Rome and the condition of Italy.

Mombasa, seaport and tn. of Brit. E. Africa on the E. coast of Mombasa Is. The is. of M. is 3 m. long and 2 m. wide, and has an area of $\frac{1}{2}$ sq. m. It is separated from the mainland by a narrow channel, the N. part of which leads from the Indian Ocean to M. Old Port, while the S. part leads to Kilindini Quay and railhead. All about the is. are groups of huts occupied by Swahilis, Indians, and members of the different tribes resident on this part of the coast. Kilindini, the chief port of the is., is thoroughly modern, with spacious sheds along the quay. M. Old Port has been used for centuries and is situated on the N. side of the is., where it is dominated by the old Arab tn. It is now used exclusively for dhows. At M'Baraki on the is. of M. is a slipway and anchorage for yachts.

The Portuguese sailed into M. in 1498, when Vasco da Gama had an unfriendly reception. The tn. was sacked by Pedro Cabral in 1500 and in 1505 by Francesco de Almeida, the first Portuguese viceroy of India. In 1698 the Arabs entered the port after the garrison had held out until only eleven men and two women were left, these being murdered by the Arabs before the Portuguese fleet could reach the place. In 1729 the Portuguese were driven out of E. Africa for all time. In the early nineteenth century an abortive attempt was made to set up a Brit. protectorate. After the suppression of the Mazrui rebellion in 1896, the limits of the E. Africa Protectorate were proclaimed, since when the inhab. of M. have ceased to be in a state of petty warfare. A great stride forward was the construction of the railway from M. to Kampala, Uganda (1895-1901), later extended to Lake Magadi (opened in 1913). For many years the hist. of M. has been merely a tale of commercial development. A detailed account of early settlements by the Arabs will be found in *The History of the Imams and Seyyids of Oman* by Sall-i-Jbn-Razik, which has been trans. into Eng. Pop. 102,500 (of is.).

Momein, or Teng-yuah-ting, tn. of Tun-

nan, China, 135 m. E.N.E. of Hhamo (Burnia). It has important cattle markets. Pop. 6000.

Moments. The moment of a force about a given point is the product of the force and perpendicular drawn from the given point upon the line of action of the force. The moment is zero when either the force is zero or its line of action passes through the given point. Moments may be represented graphically by the area of a

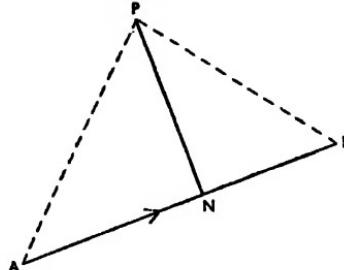


FIG. 1

triangle. If P (Fig. 1) is the given point, AB represents the force in magnitude and direction, PN is drawn perpendicular to AB, then the moment of the force about P = $AB \times PN$ which is equal to twice the area of the triangle PAB. From considerations of such areas, it may be deduced that the algebrical sum of the moments of a system of forces about a point is equal to the moment of their resultant about that point, paying due regard to sign. The common convention of signs is that the moment is positive if

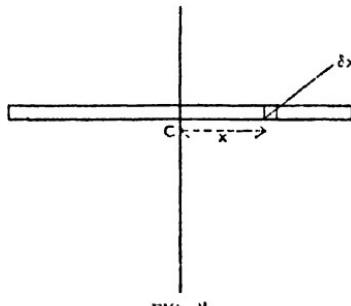


FIG. 2

the force tends to turn the body about the point in a counter-clockwise direction, negative when the body tends to turn in the opposite direction.

Moment of Inertia.—A constant of a body which is most important in the mathematics of the rotation of a rigid body. Consider a rigid body divided up into very small particles, the moment of inertia of the body about a given axis is defined as the sum of the products obtained by multiplying the mass of each

element by the square of its distance from the given axis. A few simple cases are noticed here. The easiest method of calculating the moment of inertia is by means of the integral calculus. A uniform rod of length $2l$ and line density ρ rotates about an axis perpendicular to it through its centre C (Fig. 2). Take an element

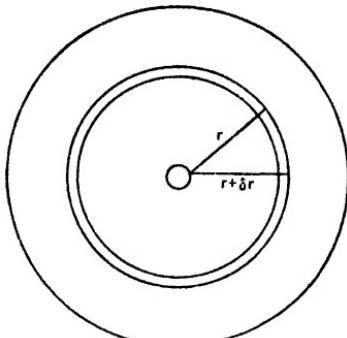


FIG. 3

δx at distance x from C. Its mass = $\rho\deltax$, therefore its moment of inertia = $\rho x^2\deltax$, therefore total moment of inertia of the rod

$= \int_{-l}^l \rho x^2 \delta x = 2\rho l^3 / 3 = M l^2 / 3$, where M = total mass = $2l\rho$. The moment of inertia of a rectangle, sides $2a$ and $2b$, is found by dividing it up into thin rods parallel to one

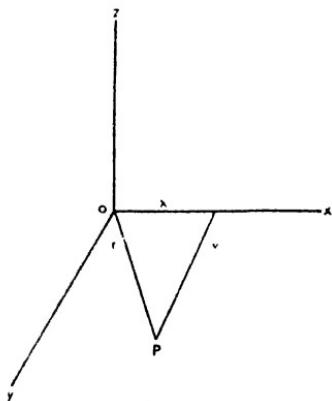


FIG. 4

side, e.g. side of length $2b$. Then the moment of inertia of the rectangle about a line through its centre parallel to the side $2a = M b^2 / 3$, where M is the total mass of the rectangle. A circular plate (Fig. 3) is divided up into annular rings. If O is the centre, take the ring, the radii of whose boundaries are r and $r + \delta r$. Its

mass = $2\pi r \rho \delta r$, where ρ = density. Its moment of inertia about an axis through O perpendicular to the plane of the plate = $2\pi \rho r \delta r \times r^2$. Total moment of inertia of the plate = $\int_0^a 2\pi r^3 \delta r$, where a is the radius. Therefore moment of inertia = $M a^2 / 2$, where M = mass of the plate. Two very important theorems in connection with the theory are the following: (1) If we take three perpendicular axes ox , oy , oz (Fig. 4), and consider the moment of inertia of a particle of mass m about these axes, the position of the particle being in the xy plane and having co-ordinates (x, y) , i.e. $oM \perp x$, $MP \perp y$, then $I_x = mx^2$, $I_y = my^2$, $I_z = m r^2$, where I denotes the moment of inertia, and the suffix the axis about which the moment of inertia is taken. Then $I_x + I_y = m(x^2 + y^2) = mr^2 = I_z$. (2) Again, if I_1 = moment of inertia of the body about an axis through the centre of gravity and I_2 = moment of inertia about a parallel axis at a distance h from it, then $I_2 = I_1 + Ma^2$, where M = mass of the body. Thus the moment of inertia of a circular plate about an axis perpendicular to its plane = $\frac{Ma^2}{2}$, and the moment of inertia about a diameter = $\frac{Ma^2}{4}$, since the first axis is perpendicular to the diameter and, from the symmetry of the figure, the moment of inertia about any diameter is the same. Any two perpendicular diameters may be taken, the result following by the first theorem. The moment of inertia about a tangent $= Ma^2 / 4 + Ma^2$ by the second theorem.

Bending Moment. — Consider a beam fixed at one end, a load can be applied to the other greater than it can bear. The beam may bend to such an extent that rupture takes place or one part slides over the other. If the beam does not break the load still tends to produce the above results which tendency is resisted by stresses called into play in the beam itself. Clearly when the beam bends, the upper surface is elongated and the lower surface is compressed, and the stresses generated are obviously equal and opposite in direction, thus constituting a couple. This couple resists the bending which necessarily must be caused by an external couple, which is called the bending moment at the section of the beam under consideration, and is equal to the moments of the external forces on the part of the beam on one side of the section about the section.

Examples: (1) *Cantilever with a load at the free end* (Fig. 5). — Take section AB, whose distance from the free end = x . Then the bending moment at this section = Wx . If the bending moment is represented graphically by y the bending moment is represented by the triangle, since $y = Wx$. (2) *Cantilever with uniformly distributed load* (Fig. 6). — Let $w = \frac{W}{l}$ = weight per unit length. Then

load on part DC is considered as acting at its centre of gravity. Bending moment at AB = $\frac{1}{4}wx^2$. The bending moment

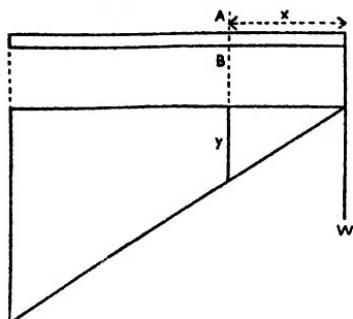


FIG. 5

diagram in this case is a parabola and the bending moment is represented by y . (3) Beam uniformly loaded and supported at both ends (Fig. 7).—Let R₁ be the reactions at

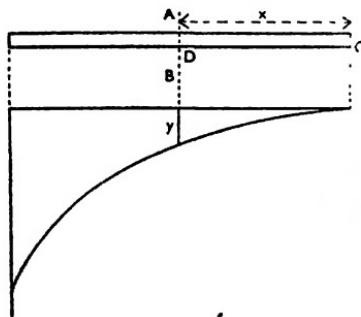


FIG. 6

w weight per unit length. Then bending moment at AB, $R_1x - \frac{1}{2}wx^2 - \frac{1}{4}wx^2$ ($L-x$), where L = length of the beam. Bending moment diagram is a parabola. The

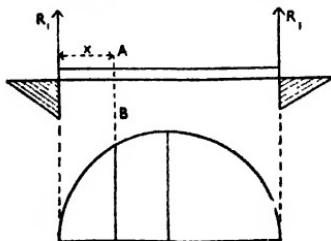


FIG. 7

bending moment is clearly greatest at the middle point = $\frac{1}{4}w\left(\frac{L}{2}\right)^2 = \frac{wL^2}{8}$. The more complicated questions of rolling loads, and

loads unevenly distributed, admit of similar solutions.

Turning Moments.—A flywheel of an engine acting against a friction brake is an example of this. The wheel rotates against a force, and thus there is a turning moment which in the steady state of motion is equal to the moment of the frictional force about the axis.

Momentum, quantity in dynamics obtained by multiplying the mass of a body by its velocity. It is a directed quantity, and the M. of a system of particles is obtained by adding together the M. of the sev. component particles according to the vector law. The impulse of a force on a particle is measured by the change of M. it produces in it. By Newton's third law the total M. of a system cannot be altered by any action between its component parts. This principle is known as the conservation of M.

Momerie, Alfred Williams (1818–1906), Eng. divine, b. in London. He was ordained priest in 1879. In 1880 he was appointed prof. of logic and mental philosophy at King's College, London, and in 1883 chosen morning preacher at the Foundling Hospital. He pub. sermons and works on the philosophy of Christianity.

Mommsen, Theodor (1817–1903), Ger. classical scholar and historian, b. at Garding in Schleswig-Holstein. His detailed knowledge of Rom. hist. and critical methods of procedure attracted the attention of the Berlin Academy, who commissioned him to examine Rom. inscriptions in France and Italy. In 1848 M. became prof. of jurisprudence at Leipzig, but he was compelled to retire from this office in 1850 owing to his revolutionary tendencies in politics. In 1852 he was appointed to the chair of Rom. law at Zürich, and in 1854 he became prof. of the same subject at Breslau. In 1858 he became prof. of anet. hist. at Berlin, and during his professorship he compiled the famous *Corpus Inscriptionum Latinarum* and assisted in the compilation of the *Monumenta Germaniae Historica*. From 1873 to 1895 he held the position of secretary to the Berlin Academy of Sciences. From 1873 to 1882 he was a member of the Prussian House of Representatives, and was consistently democratic in his views. His chief works, beside those mentioned, are *Oskische Studien* (1845); *Die Unteritalischen Dialekte* (1850); *Corpus Inscriptionum Neapolitanarum* (1851); *Die Rechtsfrage zwischen Caesar und dem Senat* (1857); *Geschichte des römischen Münzwesens* (1860); *Res Gestae Divi Augusti*; and an ed. of the famous *Monumentum Ancyranum*. But it is for his *History of Rome* (1853–56) (see *Everyman's Library*, Eng. trans.) that the name of M. will chiefly be remembered. The author's extensive knowledge and critical insight place the work in the forefront of Rom. historians. See studies by C. Bartsch, 1903; L. M. Hartmann, 1908; U. von Wilamowitz-Moellendorff, 1918; and W. Weber, 1929.

Momordica, genus of tropical climbing

plants (family Cucurbitacem), with white or yellow flowers and ornamental gourds of various shapes, sometimes called balsam apples. *M. Balsanica* is the balsam apple. *M. Charantia* the balsam pear.

Mompos, old tn. in the dept. of Bolívar, Colombia, S. America, on the Magdalena R., 110 m. S.E. of Cartagena. It is reached by riv. steamer from the latter city or Barranquilla. The chief industries are cattle-farming and tobacco-growing. The Colegio de Pinillos is noted throughout Colombia as a seat of learning. Pop. 20,000.

Mona, name used by Tacitus for the isle of Anglesey.

Monaco, small It. principality, bounded on the S. by the Mediterranean and surrounded on all its other sides by the Fr. dept. of Alpes-Maritimes. Area 8 sq. m. The small harbour, absolutely sheltered, has an area of nearly 50 ac., with a depth of 90 ft. at the entrance. M. came into the hands of the Grimaldi family in 968. In 1715 it passed into the female line, and on the death of Louise Hippolyte, her husband, count of Thorigny, succeeded under the name of Jacques I. It was annexed by France in 1793, and was ceded to Sardinia in 1846. It then came into the possession of King Victor Emmanuel, who sold it to France in 1861. The principality is still under the protection of France. Until 1911 the prince was an absolute ruler, but in that year a constitution was estab. providing for a national council elected by universal suffrage. In 1819 the govt. adopted a code based on the Fr. codes and a court of first instance, as well as *jugé de paix's* cour. The principality issues its own separate postage stamps, and has its own flag. M. is the seat of a Rom. Catholic bishop (since 1887). The cap. is M. (pop. 2500), where there is an international hydrographic bureau, other tns. being La Condamine (12,000), and Monte Carlo (12,000) where a motor rally is held. The principality flourishes chiefly on the famous casino and gardens. The climate is temperate and pleasant. Palms, olives, oranges, citrons, and aloes grow abundantly. The cap. has a fine palace, cathedral, college, museum, etc. Perfumery, spirits, and pottery are the chief manufs. Prince Louis II. (1870-1949) became ruler in 1922. Normally the succession would have passed to his daughter, the comtesse de Pignacq, but she renounced her rights in favour of her son Prince Rainier (b. 1923). Pop. of principality, 19,200. See A. Sinith, *Monaco and Monte Carlo*, 1912; L. H. Labande, *Histoire de la principauté de Monaco*, 1934; and F. W. Picard, *Monaco and the French Riviera*, 1937.

Monad and Monadism. The philosophy of Leibniz (q.v.), which is included in these terms, is intermediary between that of Spinoza (q.v.) or monism, and that of Descartes (q.v.) or dualism. A monad may be said to be the ultimate constituent of all substance; monads are simple and similar in constitution; they differ only qualitatively; each is a self-contained individuality, and a monad has two

qualities, perception, or capacity to mirror the universe, and appetite, or striving. From the highest monad, which is God, to the very lowest all are constituted so that at all moments they are all in harmony, although each works out its own development under its own laws independently of all the others. Man is built up of a complexity of monads, while his soul is a single monad, the centre of his being. See G. W. Leibnitz, *Monadologie* (trans. by R. Latta), 1898, and *Nouveaux Essais* (trans. by A. G. Langley), 1896.

Monadnock, Mount, or Grand Monadnock, isolated mt. in Cheshire co., S.W. of New Hampshire, U.S.A. Altitude 3186 ft.

Monagas, state of N.E. Venezuela, with the gulf of Paria on the E., Sacre to the N., Anzoátegui to the W., and having the R. Orinoco as its S. boundary. The state slopes from the W. to the E., is fertile, and has a number of lakes. The cap. is Maturín. Area, 11,155 sq. m. Pop. 122,900.

Monaghan: 1. Inland co. in the prov. of Ulster, Eire. The N. is watered by the Blackwater, the S. by the Fane and Glyde, and the W. by the Erne. The surface generally is hilly, the Slieve Beagh range, 1250 ft. at its highest point, extending along the whole N.W. boundary into Fermanagh. None of the rvs. are navigable. The Ulster Canal, which unites loughs Neagh and Erne, traverses the co. near M. and Clones. The S. contains rich and productive land, but the most fertile part is the central, including the baronies of M., Cremonie, and Dartree. Agriculture is the main occupation, flax and wheat being the chief products. Linen is the chief manuf. The area is 500 sq. m. Pop. 58,000. 2. The co. tn., 15 m. W.S.W. of Armagh, contains the college of Macartan and a Rom. Catholic chapel. The bor. obtained its charter from James I. Pop. 4700.

Monandry, see under FAMILY.

Monapia, see MAN, ISLE OF.

Monarchianism. The term applied derisively by Tertullian to those heretics of the second and third centuries who denied the doctrine of the Trinity and constituted themselves the defenders of the monarchy of God or Christian unitarianism. Latter-day historians classify monarchians into the Adoptionists (from the view that Christ was the Son of God by adoption only) or Dynamist sect, who held Christ to be a human being endowed with divine powers, and the Modalist sect, who regarded Christ as the incarnation of God the Father, and maintained generally that the Trinity was really reducible to different conceptions under which the One Divine Being might be viewed. It seems that one Theodosius, a shoemaker, was the first to teach that Jesus was mere man, and incurred excommunication for his views. Artemon, who belonged to the ante-Nicene Monarchians (or Adoptionists), declared the doctrine of the Trinity to be an innovation dating from Zephyrinus and a relapse into heathen polytheism. He also asserted that Christ was a mere man, but born of a

virgin, and superior in virtue to the prophets. His views, for which he, too, incurred excommunication, were developed by Paul of Samosata (see Eusebius, *Historia Ecclesiastica*). The dynameitic heretics are largely associated with the Alogians, or deriders of the Logos q.r.), the term Alogians or Alogi being invented to emphasise their rejection of the divine Word preached by John. The name mainly associated with the Modalistic M. is that of Praxeas, against whom Tertullian especially hurled his fulminations. Praxeas was both Monarchian and Patripassian (the W. name for the heresy of Sabellius, viz. that God the Father became incarnate and suffered (*passus est*), the Son being only a form or modality of the same Person). They were more widely spread than the Adoptionists; but both sects belong only to the early centuries. See L. J. Texier, *Histoire des dogmes*, i., Paris, 1905; L. Duchesne, *Early Historians of the Christian Church*, i., 1909; and P. Hughes, *History of the Church*, i., 1931.

Monarchy, see SOVEREIGNTY.

Monarda, genus of N. Amer. perennials (family Labiateæ). *M. didyma*, the sweet bergamot, or Oswego tea, bears whorls of fragrant scarlet flowers from June to Aug.

Monash, Sir John (1865-1931), Australian soldier, b. at Melbourne, of Jewish descent and educated at the Scotch College and Melbourne Univ. M. has been styled the greatest Jewish soldier since Masséna; he was certainly the only one to rise to the command of an army corps during the First World War, and reached higher rank as an officer in the Brit. Army than any previous Jewish soldier. In Gallipoli he showed tactical perception and powers of organisation, and in 1918 he succeeded Gen. Birdwood (q.v.) in charge of the Australian Corps. After the Armistice he organised the repatriation of the Australians.

Monastery, abbey, priory, or convent for monks or nuns dedicated to the religious life. An abbey (as the name implies) is under the rule of an abbot or abbess; similarly a priory is ruled by a prior or prioress. In cathedral Ms. the bishop was the abbot, and the superior of the estab. was a cathedral prior. In its early stages, when monasticism was practised in the eremitical form, the Ms. were merely groups of cells or huts. St. Pachomius, the founder of coenobite Ms., built his first M. in the form of a vil., with rows of huts large enough to accommodate three monks in each, and with a common refectory and a church. Under his rule the monks worked at different trades such as tailoring, carpentering, etc., so that workshops formed part of the buildings, the produce being shipped to Alexandria and sold to support the community. As time went on and the number of convents grew, experience led to the formation of a regular plan; the estabs. were made more compact, which also helped to guard them from outside attack, and were encompassed with means of defence, the monks erecting massive buildings, containing all

the necessary accommodation and surrounded with high walls as a protection against a possible enemy.

The E. or oriental Ms. differed in their architectural plan from those of the W. That of Santa Laura (i.e. Holy M.), Mt. Athos, may be taken as a typical E. M. It is enclosed within high stone walls, and occupies between 3 and 4 ac. of ground. The main entrance, which is composed of three iron doors, is on the N. side, and is guarded by a tower, the only other entrance being a small postern on the S. side. On entering there is an outer court-yard with a chapel immediately facing, and to the left the guest-house with a cloister running along the front. The refectory, kitchens, storehouses, etc., are also in this court-yard, which thus becomes the centre of the material life of the community, while the inner court-yard forms the centre of the religious life. As one enters, the church at once arrests attention as the chief feature of the whole building. It is placed almost in the middle of the court-yard, which is surrounded by cloisters on to which open the cells of the monks, and in front of it there is a marble fountain. Although the refectory stands in the outer court-yard, the entrance is effected from the inner court-yard; it is a large cruciform building, and is decorated with frescoes representing various saints. In the E. M. this building is usually found sited near the church, in the place of a chapter-house; meals are often taken in solitude in the cells.

The Coptic Ms. adopted a different plan of architecture, the court-yards being absent. The church occupies the N. side of the building, and alongside it runs an immense gallery with the cells opening out on either side. During the great monastic epoch that followed St. Benedict (see MONASTICISM) a great number of beautiful Ms. were built. The Benedictine Ms. all followed one architectural plan, which was, of course, modified according to the site. The buildings were erected in a series of groups; the church, as the centre of the religious life of the community, formed one side of a square cloister, round the other sides of which were other buildings forming a necessary part of the monastic life, the chapter-house, the dormitory, the common room, and the refectory. Another group was formed by the infirmary, with its garden and the school for the novices, while beyond the convent enclosure lay the abbot's house and the outer school, with the guest-house for distinguished visitors not far distant. In large Ms. there were sometimes three guest-houses: the one already mentioned, the other two being for monks and poor travellers and placed on either side of the main entrance. The buildings connected with the material wants of the community lay to the S. and W. of the church, the kitchen, buttery, bakehouse, brewhouse, etc., the refectory being reached by a passage from the kitchen, and beyond these again were ranged the workshop, stables, and farm buildings. The great Swiss M. of St. Gall (A.D. 820) was a typical Benedictine M., and the same plan is

followed out more or less faithfully in most of their buildings, with slight variations due to the locality. So, for instance, at Canterbury the cloister and monastic buildings are situated to the N. of the church instead of the S. as is usual, and at Worcester and Durham the dormitories show a slight difference in arrangement. At Westminster Abbey and St. Mary's Abbey, York, the normal Benedictine plan is adhered to. Buckfast Abbey is another example of the Benedictine style.

The Cluniacs grouped their buildings somewhat differently, and in the plan of the abbey of Cluny, founded by Wm., duke of Aquitaine, the cloister is placed considerably further W. than is usual, and the monastic buildings do not open out of it, but are placed in a separate group.



John H. Stone

BUCKFAST ABBEY

Moreover Cluniac Ms., except Cluny itself were ruled by priors, not abbots, so that the abbot's estab. is lacking. There were not a great number of Cluniac houses in England; the one at Lewes was the first, but the best preserved are at Castle Acre and Wenlock.

Following on the Cluniac Ms., came those of the Cistercians, the chief characteristic of which was their plainness and simplicity, the outward expression of the rigid rule they adopted. Unnecessary decoration of any sort was forbidden, such as turrets, pinnacles, or stained glass, and the sites chosen were usually wild and desolate. The effect of these regulations was the production of a definite Cistercian style of monastic building, of which Fountains is a good example. The first of their houses was the abbey of Citeaux. They followed out a particular plan. The buildings were divided into two wards, separated by a wall. In the outer were the barns, granaries, stables, workshops, etc., and in the inner the monastic buildings proper, with the church occupying the central position. At Clairvaux (A.D. 1116) there are two cloisters, and on the E. side beyond the monastic buildings

there are gardens, orchards, and fishponds placed outside the convent walls. The church was also built on a slightly different plan from those of other communities, with a very short E. limb, which was, as a rule, square. It also invariably had two square chapels on the E. side of the transepts, which were divided off with solid walls, and at Clairvaux there are nine chapels radiating round the apse, also divided by solid walls. In the Cistercian Ms. the chapter-house was always quadrangular, and was divided into two or three aisles by pillars and arches. The position of the refectory is also a characteristic; in the Benedictine houses it was placed parallel to the nave of the church on the side of the cloister furthest removed from it, and it ran E. and W., but in the Cistercian houses it was placed at right angles to the church, and ran N. and S. The buildings may be placed in five groups: (1) The outer ward containing all the buildings connected with labour of all kinds. (2) Those connected with hospitality and the material requirements of the community placed just within the inner ward. (3) The church and monastic buildings. (4) The inner cloister, with the library, lecture-hall, and literary requirements. (5) The infirmary and novices' quarters. The first Cistercian house to be founded in England was that of Waverley Abbey, near Farnham, of which but little now remains. That of Fountains Abbey, Yorkshire, is the best preserved, others being at Rievaulx, Kirkstall, Tintern, Netley, etc.

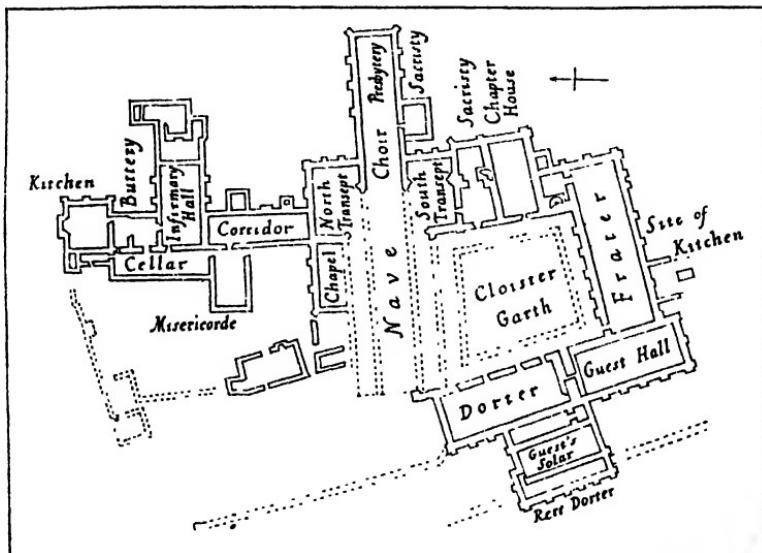
The Augustinian Ms. followed the Benedictine plan more or less, but a leading characteristic of their buildings is the immense length of their churches, which were devised to accommodate large congregations. At Llanthony and Christ Church (Twynham) the choir is shut off from the aisles. Sometimes there are no aisles at all, as at Bolton and Kirkham, while at Brinkburn and Lanercost there are only N. aisles. The abbey of St. Augustine at Bristol was typical of the Austin canons, their church now being used as the cathedral.

The Premonstratensians (so called from their first abbey at Premontré in France), in building, followed the plan of the Austin canons, of which they were a branch. The first Eng. estab. was at Newhouse in Lincolnshire (A.D. 1140), but the best preserved are those of Easby, Yorkshire, and Bayham, Sussex.

The Carthusian monks departed from all the other communities in their architectural plan, owing to a wide difference in their rule. Their order sprang up as a revival of the eremitical life, and as solitude and silence were enjoined by their founder, St. Bruno. It was necessary to build in such a manner that this could be carried out. The M. was therefore arranged in a series of detached cells or small cottages, each containing a living-room, sleeping-room, etc., with a small garden surrounded by a wall, and opening on to a corridor, which in its turn opened on to a cloister connecting the whole. At the great Carthusian M. of Clermont these

cells occupy three sides of the cloister, and on the W. lie the church, the chapter-house, and refectory, with the other necessary offices. This arrangement is invariably found throughout the charter-houses, as they were called in England, of which there were never more than nine. The best preserved is that of Mt. Grace in Yorkshire, though that of Witham in Somersetshire is the earliest. Others were at Sheen, Richmond, and the famous Charter House in London. The modern charterhouse at Parkminster, Sussex, is built according to the old plan.

necessity adapted to the sites chosen, so that there was seldom any regularity in the buildings, and their best efforts were concentrated on their churches, which were built with a view to accommodating large congregations. These were generally long-shaped buildings without any transepts, the nave being divided into two parts, one for the brotherhood and the other for the congregation. The E. end was as a rule square. One of the best preserved Eng. friaries is that of the Dominicans at Gloucester, where there is also a Franciscan convent. The Dominicans'



PLAN OF EASBY ABBEY

Marie Hartley

The above sketch plan is reproduced, by permission of the Ministry of Works, from a measured plan.

A medieval experiment which has never been revived is that of double Ms., the first examples of which occur in Gaul in the seventh century. In these two separate communities of monks and nuns occupied adjacent buildings and often worshipped in the same church. The nuns' convent was the more important as a rule because the monks (or canons) were instituted primarily to administer sacraments and instruct the nuns; of such were the abbeys of Whitby and Ely in A.S. days. The orders of Gilbertines (1146) and Bridgettines (1346) were composed on this plan, and in the Bridgettine houses the abbess ruled the whole double M., the prior of the monks being subordinate to her.

A word must be said about the monastic buildings of the Mendicant orders, which formed a distinct class. They were usually planted in large tns., and were of

house at Norwich may also be mentioned. Of the Carmelite or White Friars, the best example is the abbey of Iluine near Alnwick, which was their first foundation in England (A.D. 1240). Of the Black Friars (Dominicans) and Grey Friars in London, only the names remain, but the nave of the church of the Austin Friars has been preserved. The destruction of the beautiful Ms. in England was the work of Henry VIII. and his adviser, Thomas Cromwell. They saw in the monastic property vast possibilities of wealth. The Act of Dissolution passed in 1536 suppressed all Ms. with an income of less than £200 a year, but though this still left the larger Ms. free, they fell into the king's hands in 1539 through the Act of Suppression and the attainment of individual abbots. The properties were acquired by nobles who often used them as quarries for materials for building their own houses. See A.

Lenoir, *Architecture monastique*, 1852-56; F. Gasquet, *English Monastic Life*, 1904, containing full bibliography; H. Thompson, *English Monasteries*, 1913; M. R. James and A. Thompson, *Abbeys*, 1925; F. H. Crossley, *The English Abbey*, 1935, 1945; C. Baskerville, *English Monks and the Suppression of the Monasteries*, 1947; and H. E. Roberts, *Notes on the Medieval Monasteries and Ministers of England and Wales*, 1949. For a list of Eng. houses see D. Knowles, *The Religious Houses of Medieval England*, 1940. See also R. E. Swartwout, *The Monastic Craftsman*, 1932.

Monasticism (from Lat. *monachus*, a monk; Gk. *μοναχός*, solitary), general name descriptive of a mode of religious life which has prevailed in the Church from almost the earliest ages, and which, during many periods of its hist., has formed the most characteristic and powerful expression of its activity. It sprang into settled existence during the third century, and was the natural product of many influences then moving the Church. Previously to this period, indeed, a system of solitary and ascetic devotion is found prevailing among the Jews both in Palestine and in Alexandria. And a life of dedication or consecration of persons, who, however, continued to live with their own families was known in the first Christian centuries. This was the germ out of which the monastic life grew; a stimulating factor may be found in those hardships and persecutions which oppressed the Church, and the spirit which these persecutions naturally quickened and fostered. During the severities which followed the edict of Decius in the year 250, many Christians were driven from their homes in search of shelter from the relentless vengeance which pursued them. It is not easy to estimate how far this contributed to the growth of monastic life, the key idea of which, both inside and outside Christianity, is the seeking of seclusion and the withdrawal of all material comforts in order to obtain complete concentration on the contemplation of divine things. In fact, these two ideas, mysticism and asceticism, are universals which appear in all intense religious movements, and we should not overstress the importance of persecutions in the origin of Christian M. Recent scholarship has also shown that the idea of doing solitary battle with the devils in the wilderness was present in the minds of the early solitaries. Egypt was the fruitful soil in which such thoughts germinated and sprang to maturity.

The prim. names in the E. in the origin and growth of these ideas are Pachomius (q.v.), Antony (q.v.), and Basil (q.v.), the last of whom may be regarded as the first in point of time to give to the monastic life a fixed and permanent form; but it was Pachomius and Antony who drew such attention to the monastic life as to spread abroad its fame and attract many to its adoption. Pachomius was born about the year 292, and estab. the first actually organised monastery at Tabennisi (Tabennisi), an is. in the Nile, near Dendera, and later founded the first nunnery under the presidency of his sister.

At his death there were nine cenobitic institutions and 6000 monks and nuns. Antony was born on the borders of upper Egypt, in the vil. of Coma (Koma), in the prov. of Heracleopolis, about the year 251. A spirit of simple and earnest piety animated him from his youth. Losing both his parents about his twentieth year, the care of a young sister and of considerable property devolved upon him. Setting aside the ordinary Christian obligations arising out of this position, he disposed of his property, and embraced a life of voluntary poverty in which he might without impediment give himself to spiritual duties. He sought a distant retirement, where he remained for twenty years, maturing a saintly renown which spread abroad his fame. Followers gathered around him despite his efforts to maintain his privacy: and the first rudiments of a monastery grew up in this wilderness. The life of Antony was prolonged to upwards of a hundred years, and his fame grew with his years. He distinguished himself as the warm friend of Athanasius in his contest with Arianism; and it is to this circumstance that we probably owe the record of his life from the pen of Athanasius. Hardly less famous were Paul the Hermit and the older and younger Macarius. The movement thus stimulated by Antony speedily spread into Syria and Palestine. Hilary, a disciple of Antony, was chiefly instrumental in the promotion of M. in Palestine; while the great Basil of Cesarea, the fellow student and friend of Gregory Nazianzus, warmly embraced its spirit, and more than any other contributed to its progress throughout Syria and to the shore of the Black Sea. The rule of Basil was to the E. what that of Benedict was to the W. in that it absorbed or supplanted all previous methods, while unlike the great W. rule it has had no competitors, and remains to this day the single monastic code of the oriental Church. This rule is embodied in the *Asetic Sermons* of Basil and in his recensions notable for their lofty piety. The development of oriental M. thus in effect ceases with the Basillian rule, apart from the institution of the Akioimoi or 'sleepless' monks in the fifth century, for the purpose of maintaining in relays unbroken prayer, a system imitated in the W. and known as the *laua perennis*. It survives to-day in communities founded for perpetual adoration. Gregory Nazianzus never assumed, like Basil, the monastic vows; but the triumph of the asetical bent was scarcely less complete in him than in his friend. While the institution of M. thus extended itself, from the example of Antony, not only in Egypt, but throughout the E., its more complete organisation is associated with the name of Pachomius, another Egyptian ascetic. To him is attributed the foundation of the cloister life according to a regular system and the beginnings of monastic organisation. The monastery of S. Pachomius was a half-way stage between the scattered hermits without organisation and the strictly organised monasteries of SS. Basil and

Benedict which developed later. It was known as a *laura*. The earlier Anchorettes, who lived in single cells, with only a casual combination and without submitting to any definite rule, for the most part died out or were absorbed into the more regular estabs., though some remained. The most various results, as may be imagined, sprung from an institution like E. M. In some cases there was formed a pure spirit of devotion, such as that which animated its great founder Antony. A ready and generous hospitality distinguished the cloisters. The traveller was offered with an ungrudging spirit maintenance and lodgings. Perhaps the most astounding phenomenon among these E. solitaries is that of the famous Simon Stylites, who passed thirty years on the top of a pillar 60 ft. from the ground. Athanasius was partly responsible for extending M. into the W. During his compulsory sojourn in Rome in 341 he brought with him certain Egyptian monks, whose austerities and devotion attracted interest and at length admiration. His *Life of Antony*, moreover, which was speedily trans. into Lat., gave a great impulse to the monastic spirit. All the most illustrious of the W. teachers contributed by their approval to this result. Ambrose of Milan, Martin of Tours (the first notable monk in the W.), and Augustine were drawn within its influence, and lent it their encouragement. Amongst many documents attributed to Augustine, the only one resembling a monastic code is his epistle (109th) censuring the nuns of a convent which he had founded at Hippo but which had fallen away from discipline. But his personal example gave rise to a new sort of common life, in that he formed a kind of college of priests, this being the origin of the institute afterwards so well known as the Austin canons, and the pattern of certain eleventh-century foundations. Another contribution of Augustine to the hist. of the common life is his *De Operis Monachorum*, a treatise in which he emphasises the need of making hard work an invariable factor of the monastic profession. The restless activity of Jerome during his residence in Rome was exerted in its behalf, and under his influence rich and noble ladies were led to retire from the world and consecrate themselves, amid the solitudes of Palestine, to a life of devotion. The labours of Martin of Tours, and of Cassian at Marseilles, were especially successful until, in the course of the fifth century, thousands of devotees spread themselves through France into Britain and Ireland.

As a permanent form and organisation had been provided in the E., so in the W., a rule was written by Benedict of Nursia, characterised rather by its simplicity and order than by any special severity. And this rule rapidly spread through Europe, and took the place of earlier models of monastic life, among which the Celtic ones had been widely accepted. St. Benedict (c. 480-c. 543) began life as a hermit in a cave at Subiaco (near Rome). Chosen abbot of a convent near Subiaco his rule proved too exacting for his new subjects.

He accordingly resigned his abbacy and returned to his cave at Subiaco, around which he soon built twelve monasteries, each under an abbot, and containing a few monks. Attempts on his life and on the discipline of his society drove him out again, and in the year 528 he repaired to Monte Cassino, where he drafted his famous rule (529), and which has ever since held its place as the cradle of the Benedictine order, and the first abbey of W. Christendom. Rigorous as were the personal austerities of St. Benedict, he was convinced by experience that an undue severity of fasting and mortification was unsuitable for the ordinary man who wished to take up the monastic life. Two hours after midnight the monks were aroused to vigils (or Matins), and the time between this and daybreak, when Lauds was sung, was consumed in learning the psalms by heart, or some other study. These early services were followed throughout the day by manual labour and reading with regular periods for the Divine Office. During summer the day was so divided that seven hours were given to the former occupation and at least two to the latter; during winter more time was given to study, but no alteration appears to have been made in the hours of labour. Sunday was entirely given to reading, and prayer. The rule thus written by Benedict extended itself, as we have said, throughout the W., and for many years was instrumental in preserving the integrity and simplicity of devotion in its cloisters. With the gradual increase of riches, however, many Benedictine monasteries lost their primitive character, discipline varied, and standards fell considerably. Many attempts were made to revive the first fervour of the rule, and still more successfully to apply it in new forms, each of which in its turn achieved a great reputation, and powerfully helped the cause of the papacy in the different countries into which they spread. In this manner arose the congregation of Cluny, and the Cistercian and in a lesser degree the Carthusian order, all branches, as it has been said, from the stem of St. Benedict. Popes were sometimes elected from the monastic body, the most famous of them being Hildebrand, known to hist. as Gregory VII. The immortal name of St. Bernard is associated with the Cistercian order, of which the abbey of Clairvaux was a dependent. The simple purity of the Carthusians acquired for them a great reputation. Alone of the monastic orders they have never needed reform.

In the meantime, however, other forms of monasticism had arisen, the most notable and distinguished of which, dating from an early period, was the order of St. Augustine (or Austin canons). Whereas the monks had not originally been priests, this order was chiefly composed of ecclesiastics; later, however, the monks also were regularly ordained to the priesthood. There are still two further developments of the monastic system that claim notice. These are the rise and estab. of the Military and the Mendicant or Preaching orders. The former had its origin in the

close union subsisting between the ecclesiastical and the military professions in the Middle Ages, and especially out of the crusading spirit of the twelfth century. They are well known under the historical names of the Knights of the Hospital, the Knights Templar, and the Teutonic order. They took their rise in Palestine, and disappeared about the time of the Reformation. They consisted entirely of laymen who bound themselves by vow to certain services. While the Military orders arose out of the external necessities of the Church, and the warlike spirit kindled by the advance of Mohammedanism, the Mendicant orders originated in the internal dangers of the Church from the encroaching spirit of worldliness and free opinion. St. Dominic (1191) acquired his fame as a preacher against the heresy of the Albigenses and framed the bold idea of establishing an order of Mendicant preachers whose vow should specially bind them to the interests of the Holy See and the extirpation of heresy. Innocent III, at first looked coldly on the project, but its obvious policy soon gained it papal recognition. St. Francis of Assisi was a contemporary of St. Dominic, who was led to start a fraternity marked by the greatest simplicity and poverty; this was a reaction against the wealth acquired by the older orders, including now the Cistercians. The story of his interview with Innocent III, when he first appeared before him with his plan, is well known. The pope had just decided that no new orders were to be recognised in the Church, but a dream aroused him to his mistake, and led him to approve the new order. While preaching was the characteristic feature of the Dominican rule, poverty was the chief distinction of that of St. Francis; but the two orders tended to become organised on similar lines, and perform similar tasks, so that they both were noted for their mendicancy and preaching, though in different proportions. The hist. of these orders, as well as that of the Jesuits, and other clerks regular, which may be said to be a development of the monastic spirit, but in such a distinct shape as to require separate notice, is inseparably bound up with that of the papacy. Since the reformation the older monastic orders were largely thrown into the shade by these newer orders of a more active type. The learned work of the Maurist Congregation in France is, however, famous, as also the Cistercian reform of La Trappe, which produced the strictest of all the orders of the Rom. Catholic Church to-day—the Trappists. The nineteenth century was characterised by a notable revival of M. in Europe and its spread to America. After the Fr. Revolution Eng. monks returned from abroad and re-established themselves in England, Dom Guéranger in France and the brothers Wolter in Germany refounded M. in their respective countries. It. M. revived especially by the energies of Abbot Casareto of Genoa and Subiaco; the Austrian monastic orders flourished anew, relieved of the old Imperial despotism of the eighteenth century, while Swiss and

Bavarian monasteries were able to send out missionaries to the U.S.A. and elsewhere to set up M. in countries which hitherto had not known it. To-day the Black Monks of Saint Benedict form a federation containing 11,000 men and 15,000 women. The Cistercians and Trappists are organised apart. The Dominicans and Franciscans are considered as friars rather than as monks. Among modern Eng. Benedictine houses may be mentioned Downside, Ampleforth, Buckfast, and Prinknash. This article has considered only the Christian aspects of M., but it should be remembered that M. is widespread in the E. outside the Christian faith. The monasteries of Tibet are particularly famous (see LAMAIISM). See for a comprehensive sketch I. C. Hannah, *Christian Monasticism*, 1924; see also J. H. Newman, *Historical Sketches*, 1873; J. Hannay, *The Spirit and Origin of Monasticism*, 1903; F. Gasquet, *English Monastic Life*, 1904; F. Butler, *Benedictine Monachism*, 1919; G. Morin, *L'Idéal monastique* (4th ed.), 1929; especially D. Knowles, *The Monastic Order in England*, 1940, and *The Religious Orders in England*, 1948; and H. U. von Barthasar, *Die grossen Ordensregeln*, 1947.

Monastir, or **Bitoli**, cap. of the vilayet of M., in Serbian Macedonia, 136 m. by rail W.N.W. of Salonika. During the Balkan war a Turkish army surrendered to the Serbians here in Oct. 1912. Bulgaria vainly demanded the cession of M. in 1915 as part of the price of espousing the allied cause, it being the Bulgarian view that it formed part of the country of which her Balkan neighbours had robbed her in the Balkan war of 1913. M. surrendered to Gen. Mackensen on Dec. 2, 1915, in the Ger. invasion of Serbia, but was later retaken by the Serbs. M. was captured by Ger. forces, in the course of the invasion of Yugoslavia, in April 1941. There are exports of grain, tobacco, wool, and skins, and manufs. of gold and silver filigree work, and carpets. M. has been identified with the ant. Heraclea Lyncestis. Pop. 33,000.

Monazite, the orthophosphate of cerium, $Ce(PO_4)$, which is found naturally as a crystalline mineral. It contains, in addition to cerium, lanthanum, didymium, other rare earths, and a little thorium. M. crystallises in the monoclinic system, and its colour is from red to brown; hardness about 5, and density 5.2. It gives a characteristic absorption spectrum, and is radioactive because of the contained thorium. It is found in India, Indonesia, Norway (Arendal), Ceylon, Brazil, and in U.S.A., usually associated with granites, gneisses, and pegmatites. Good crystals of the mineral in bulk are rare, but M. is widely distributed in M. sand, found largely in Brazil. The main importance of M. is in the manuf. of gas mantles. The mineral contains enough thorium to make it worth while to obtain thorium, which is the main basis of gas mantles. The percentage of thorium in M. may be as much as 10, but it is usually less.

Monboddo, James Burnett, Lord (1714–1799), Scottish judge and metaphysician

practised as a barrister till 1767, when he was made judge in the court of session. Among his contemporaries he had the reputation of an eccentric because he gave learned suppers, rode on horseback after the manner of the ancients, and because in his *Origin and Progress of Language* (1773), and his *Ancient Metaphysics* (1779-99), he exposed man's affinity to the orang-outang, thus in a measure anticipating the Darwinian theory. See T. L. Peacock, *Melincourt* (1856), where the idea is ludicrously developed. Boswell describes, in his *Tour of the Hebrides*, an interview between Lord M. and Dr. Johnson.

Moncayo, mt. on the boundaries of Aragon and Castile, Spain, 55 m. W. of Saragossa. Altitude 7600 ft.

Monceau-sur-Sambre, Belgian tn. in the prov. of Hainaut, 3 m. W. of Charleroi, on the R. Sambre. It has coal-mines, blast furnaces, iron foundries, plating mills, and manufs. of fireproof products. Pop. 9700.

Mönch, peak in the Bernese Alps, Switzerland, 3 m. N.E. of the Jungfrau. Altitude 13,168 ft.

Monck, Sir Charles Stanley, fourth Viscount (1819-94), first governor-general of Canada, b. at Templemore, Tipperary. He entered Parliament in 1852 as member for Portsmouth. He was appointed captain-general and governor of Canada and Brit. N. America in 1861. M. was the chief promoter of the federal constitution of Canada (1867).

Monck, George, first Duke of Albemarle (1608-70), Brit. general and admiral, b. at Petheridge, Devonshire. He fought at Cádiz (1625) and Rhé (1627). He was a colonel under Charles I. in the Scottish war (1639). In 1644 he was taken prisoner by Fairfax at Nantwich, and imprisoned for two years in the Tower (1644-1646). He became lieutenant-general under Cromwell, and fought with distinction at Dunbar (1650). In 1654 he became commander in Scotland, and took Edinburgh in 1659. In 1660 he restored Charles II. As admiral of the fleet in 1663 he won a decisive victory over the Dutch. Lives of M. have been written by T. Gumble, 1671; F. Guizot 1838; and J. Corbett, 1889.

Monclova, tn. of Mexico, in the state of Coahuila, on the National Railways, 120 m. from Saltillo. There are large copper, zinc, lead, and silver mines in the vicinity. In the tn. are the shops of the National Railways of Mexico, steelfurnaces, a rolling mill, and an iron tube factory. The tn. is the centre of an agric. country. A railway is being built to Chihuahua. Pop. 7000.

Moncrieff, Sir Alexander (1829-1906), Brit. soldier and inventor, b. in Perthshire. He invented in 1863 the 'M. pit,' or 'disappearing system,' a method of mounting the heavy ordnance in coast batteries. A shelter receives the gun after firing, the energy of the recoil being stored and subsequently utilised to carry the gun into firing position when required.

Moncton, city and port of entry, Westmorland co., New Brunswick, Canada, on

the Petitcodiac R., 89 m. N.E. of St. John. It is the regional headquarters of the Canadian National railways (including Newfoundland railways) with large and well-equipped locomotive and car shops; it has well-developed airport, sited in an area possessing highly favourable atmospheric conditions, used regularly by Trans-Canada Airlines and Maritime Central Airways, and as an alternate airport by overseas airlines flying the N. route. Possessing ideal transportation facilities M. has become a preferred distribution centre for the Maritime Provs. and Newfoundland. Manufs. include woollens, cotton goods, foundries, woodworking, biscuits. Water supply is plentiful, electricity ample. Natural gas and oil wells are located within 14 mi. Pop. (city) 28,000; (suburbs) 19,000.

Mond, Sir Alfred Montz, see MELCHETT, Vicount.

Mond, Ludwig (1839-1909), Eng. chemist, b. at Kassel, Germany. Educated at the univs. of Marburg and Heidelberg, where he studied under Bunsen. He came to England in 1862, and introduced the process for recovering sulphur from waste products of the Leblanc soda process. In partnership with J. T. Brunner (1873) he estab. the ammonia-soda process (Solvay) at works in Cheshire, now the largest alkali works in the world. He manufactured chlorine as a by-product, and produced gas from waste products, recovering ammonia. He evolved a new process for the manuf. of pure nickel, in conjunction with Lange and Quincke, from nickel carbonyl, also his own discovery. He founded and endowed the Davy-Faraday Research Laboratory of the Royal Institution, 1906. A portion of his collection of early lit. painters, etc., he left to the nation. Pub. papers in *Transactions* and *Proceedings* of the Royal Society, Royal Institution, Brit. Association, Chemical Society, and Society of Chemical Industry.

Mond, Sir Robert Ludwig (1867-1938), Eng. chemist and archaeologist, b. at Farnworth, Lancashire, son of the preceding. He was educated at Cheltenham College, Cambridge Univ., Zurich Polytechnicum, and Edinburgh and Glasgow Unive. He collaborated with his father in the discovery of the gaseous compound, nickel carbonyl. He perfected the industrial production of iron carbonyl, and discovered the first derivative of a metallic carbonyl (cobalt nitroso-carbonyl) and a new ruthenium carbonyl. His thirty years of archaeological work was carried out in Egypt, Palestine, and Brittany.

Monday, second day of the week. The word is derived from the O.E. *Monandæg* (Moonday).

Mondonedo, tn. in the prov. and 30 m. N.E. of the city of Lugo, Galicia, Spain. It has a cathedral (thirteenth century). Pop. 12,000.

Mondovì, tn. in the prov. of Cuneo, Piedmont, Italy, 42 m. S. of Turin. It had a univ. (1560-1719). The church of S. Maria Maggiore and the cappella di S. Rocco were partly destroyed in the Second World War. Its manufs. include paper,

pottery, machinery, and textiles. Pop. 13,000.

Monel Metal, one of the prin. alloys of nickel; contains 65 per cent of nickel, 32 per cent of copper, with small amounts of manganese, iron, carbon, sulphur, and silicon. It is essentially a solid solution of copper in nickel, has great tensile strength, is not seriously weakened even at 400° C., can be cold-worked without becoming brittle, is not appreciably corroded by the air, and withstands the action of sea-water, alkalis, and ammonia. It is therefore used in a great variety of industries, for castings, chemical, textile, and laundry equipment, and for power plant components such as turbine-blading, valves, pumps, etc. See also under NICKEL.

Monera, classification of atoms of protoplasm destitute of any structural features. See PROTOZOA.

Monesen, tn. In Westmoreland co., Pennsylvania, U.S.A., on the Pittsburgh and Lake Erie railroad, 1½ m. from Charleroi. It has foundries, and manufs. steel and wire-fencing. Pop. 20,300.

Monet, Claude (1840-1926), Fr. artist, b. at Paris. M. was one of the most important artists within living memory, and a leader, if not the leader, of the Impressionists. Essentially the painter of light with all its possibilities, his efforts to analyse light pic^r into its component spectral colours greatly influenced the post-Impressionists. But it was the aesthetic value and the poetry, rather than the mere realisation of light, that inspired his talent. He was a pioneer in the discovery of 'colour in shadow' and a decorative colourist by intention, painting colour for the sake of light rather than light for the sake of colour. He visited England in 1870-71, during the siege of Paris, and then made the close acquaintance of Turner and Constable, a meeting which undoubtedly influenced M.'s whole subsequent outlook on his art, and taught him the possibilities of atmosphere. In connection with this visit, his two paintings, 'Waterloo Bridge' (1901) and 'Houses of Parliament' (1901), should not be forgotten; and two other notable pictures of his in England are the 'Plage de Trouville,' painted in 1870, and 'Verteuil: Sunshine and Snow' (1881) (included in the Lane bequest), both in the Tate Gallery. Good as are M.'s cathedrals, railway stations, and Venetian scenes, his aims and methods were better adapted to other and more characteristic subjects; he is perhaps happiest in such lovely riv. scenes as the 'Poplars on the Epte,' now in the National Gallery of Scotland, 'Views of Argenteuil' (1872), 'Cathedrals' (1874, and 1894), 'Les Meules' (1891), and 'Le Bassin des Nymphéas' (1900) are some of his most famous works. See C. Geffroy, *Claude Monet*, 1922; X. Lathom, *Claude Monet*, 1931; and S. Gwynn, *Claude Monet and his Garden*, 1934.

Money. Outside primitive, slave, religious, or military communities and the like M. commands economic activities. When its commands are inadequate there is unemployment. After the two world wars the difficulties of a M. economy as

against a military economy were often seen to the former's disadvantage. Another doubt of man's mastery of his M. economy arose from the spectacle of the nations exporting luxuries to one another when, immediately after a devastating war, they would have preferred to concentrate on first essentials. But the fact that the monetary economy has not solved all its problems of adaptation is no reason for seeking to exchange its manifest benefits for the limited advantages of a barter or slave economy.

Between the wars the importance of M. forced itself more and more on public attention. The illusion and reality of well-being induced by war spending gave rise to Utopian projects based on the magic of M. creation, while at the same time millions of people had first-hand evidence of the dangers of high inflation. The sceptical were convinced that no good could come of 'tinkering with the M. system' and that 'sound M.' was an essential of modern society. For most people sound M. was gold, or at least gold-backed M. In the article CURRENCY the emergence of gold is shown as the M. metal *par excellence*, a metal whose portability, divisibility, durability, and intrinsic value guaranteed its immediate acceptability as a medium of exchange, first as M.-by-weight and then as stamped coin. Besides being a medium of exchange, M. is a means of credit and a measure of value. It may also be regarded as a store of value, or liquid asset; but perhaps the most useful approach is to regard M. as a claim on goods and services which will be promptly honoured. Legal tender M. is by definition a means of settling debts. The legal tender currency of the United Kingdom consists of Bank of England notes of 10s. and £1, together with subsidiary token metal coins which are legal tender for limited amounts. Paper notes are of limited durability and fail entirely to meet the intrinsic value requirement, but are honoured promptly as a claim on goods and services. Gov. paper M. is at once a mere auxiliary of bank-M. and the base upon which bank-M. is built. Bank of England notes represent a claim on the community; bank-M., now the prin. M., represents a claim on a bank.

The Nature of Bank-money.—How is bank-M. created? If a man opens his first banking account by placing M. (say £100) on current account with a banker he exchanges one kind of M. for another, notes and coin for bank-M. (an entry in his favour in the bank's books). Bank-M. may be transferred from account to account by cheque, or withdrawn as notes and coin 'on demand.' Bank-M. has no intrinsic value but is of high durability, and for the larger transaction is more acceptable than currency. The banker, then, takes the customer's £100 notes and coin and gives him £100 bank-M. He keeps 10 per cent of the notes and coin in his till, leaving £90 free for lending (or the purchase of securities). The customer's action in becoming a bank depositor (keeping an average 'demand' deposit

of £100) thus increases the effective currency by £90. When this is lent out a part will return to the banking system (the customer's bank or another) and permit further loans; and so on. Ultimately the greater part of the customer's original £100 notes and coin will be outside the banking system, the £10 will (still) be in his bank supporting his £100 bank-M.; the remainder will also be inside the banking system supporting further deposits ten times their value. It is important to note that the whole of the original deposit of £100 is not multiplied by ten but only the original £10 till-M., and such till-M. as is retained against further resultant deposits. This explanation is oversimplified. Apart from the 10 per cent being a round conventional figure there are (e.g.) the following points: (a) about a third of bank deposits are time deposits as distinct from demand deposits, so that only some two-thirds of the 'further resultant deposits' are bank-M.; (b) the banker does not actually keep so much as £10 notes and coin in the till; but only some £3·5, the £6·5 representing deposits at 'the banker's bank' (the Bank of England) supported in turn by some £1·3 notes and coin (£1·3 = 20 per cent, but the percentage varies considerably). This gives a steeper multiplication factor and an effective currency increase of over £95 rather than £90. When a banker lends, say £10,000, he increases both sides of his balance sheet by £10,000, his loans are up £10,000 and his deposits (bank-M.) are also up by £10,000; £10,000 has thus been created 'by a stroke of the pen'. Nevertheless bank-M. creation resides essentially in the deposit, not the loan: if bankers handed over the loan in notes the borrowers would normally deposit them forthwith.

It is seen that the banker and his customers do create M. and that there are two limiting factors: (a) the banker's notes and coin, and (b) the 10 per cent or other ratio he thinks proper to maintain between his cash and his deposits. If this ratio were raised to 100 per cent (if deposits had always to be backed £ for £ by notes and coin) then banking would suffer a profound change; the profit of bank-M. creation would, like that of the Bank of England note, pass to the State; the gov. and other borrowers would have to pay higher rates of interest; and the depositor would have to pay the full cost of the convenient cheque system. There are several books by Prof. Soddy in favour of such a £ for £ system and a later book, *100% Money*, by Prof. I. Fisher. It is claimed that the system would facilitate control of inflation and deflation.

For the individual banker bank-M. is based on notes and coin, but for the monetary authorities notes and coin are based on bank-M. When it is decided that more M. is needed the Bank of England increases its deposits by lending more freely and/or buying more gov. securities by 'open market operations'. As M. is paid away to customers of the other (commercial) banks their 'cash' is swollen with increased deposits at the

Bank of England; and with increased cash they are in turn in a position to expand their loans and deposits. Increased deposits mean increased demands on notes and coins centring on the Bank of England, and since the authorities knew beforehand that 'who wills the bank-M. wills the notes and coins,' the latter will be forthcoming: the Bank of England will transfer securities to its issue dept. against newly printed notes; and coin may be bought from the Mint. Here is the answer to the frequent question; why, if more M. is the cause of higher prices, does the gov. not cancel some of the paper M.? If and when the fruits of gov. policy have made it possible to reduce the country's M., the Bank of England will reduce its deposits by reducing its loans and selling securities. Less deposits in the Bank of England will mean less deposits in the other banks and less need for notes and coin. Under gold standard procedure Bank action comes first.

The Bank of England Note is 'a claim on the community.' In the days of gold coin the holder of a £5 note had a claim on the Bank of England for five golden sovereigns, which when new contained £5 worth of metal. To-day the Bank of England is a state bank, but the holder can no longer get gold for his note. Gold indeed was never his ultimate objective. Bank-notes or golden sovereigns bought him goods and services and that his 'inconvertible' bank-note will still do. How much it will buy depends on how many there are, exactly as in the case of golden sovereigns. This idea of the limitation in the amount of M. is of the first importance. A gold currency enjoys a natural limitation in amount. There is a limited amount of gold in the world, and the rate of increase is limited by the number and size of mines and the profitability of working them. There is no such limit on paper M. and its proper limitation must be sought elsewhere. Meantime 'how much . . . depends on . . .' how many' (the Quantity Theory in its crudest form) needs qualification. Faster spending will heighten the effect of more M. and slower spending offset or reverse it. The expectation of (still) more M. (or less) will also heighten the effect. More goods and services on the other hand, or the expectation of them, allow more spending without increase of price.

Price Level Policy.—It has been seen that, apart from the growth of the banking habit, the country's M. varies in amount when the banker's cash is varied by an increase or decrease of deposits at the Bank of England (assuming he lends fully on the 10 per cent basis) and that the Bank of England (in accord with the Treasury) can vary its deposits as may be thought desirable. It is clear that for the proper limitation of bank-M. and of paper M. we must look to gov. policy. As to the aim in regulating the M. total, many think the question admits of only one answer; justice and expediency alike call for a stable price level. Given a suitable composite price index, based on a selected list of commodities and ser-

vices, the monetary authority would inflate or deflate as necessary in order to make deviations in the purchasing power of the £ (as shown by the index figure) as small and short-lived as possible. (*See COST OF LIVING.*) One effect of this arrangement is that if some prices fall the offsetting inflation will cause a rise in other prices. Unnecessary price variation is bad and there is much to be said for aiming at a minimum of disturbance of individual prices. There is also something to be said for the view that the secular advance in productive efficiency should be expressed in lower price rather than higher income. It would, however, be useless to attempt to settle the ideal price-level policy for Britain without reference to her foreign trade.

Exchange Rates.—M. is not international. Despite exceptions M. should be regarded as stopping at frontiers. In the absence of special arrangements, if country A wants to buy goods in country B, and conversely, then M. of country A can be bartered for M. of country B and a rate of exchange estab. What country A exports will exchange for what country B exports and there will be a running balance of payments, and no 'gap.' Any currency unit, e.g. the £, will with such a free exchange establish an open market price in terms of any other unit, a price which will reflect the relative demands of the countries concerned. If of course country A for any reason doubles its M. without increasing its production, then its M. will tend to lose half its exchange value. There will at all times be a 'natural' rate and no room for a black market.

In practice, however, special arrangements are made. Prior to the First World War the trading nations of the world were almost all on the gold standard. The £, the dollar, the franc, etc., were each composed of specified weights of gold, so that the ounce of gold commanded a fixed amount of M. of each and every country. The Bank of England and other central banks not only exchanged gold for M. at the fixed rate but also M. for gold. (The Mint indeed would make any holder's gold into sovereigns.) Whether it was desired to exchange the £ for gold or for dollars, francs, etc., there was no need to seek a black market, since the market and official prices for gold and currencies coincided. If new mines, or new processes made gold more plentiful the central banks of the gold standard countries were ready buyers and, if there was inflation, all countries kept step. A tendency to inflation in a single country, on the other hand, would reduce exports and raise imports and thus cause a loss of gold and a fall of the exchange rate to 'gold point,' which was the signal for a rise in bank rate and the deflationary counter-action which was the essence of the gold standard.

At home people can continue to buy as long as they have £s to spend. A discredited gov. in charge of the M. machine can continue spending indefinitely, at a price—the price paid by the citizens, the value of whose M. and

savings dwindles to nothing. Abroad the foreigner is not bound to that gov. or its £ and nationals can go on buying just as long as their £ makes it worth the foreigner's while. If a country fixes the value of its £, what it sells abroad will determine what it can buy abroad. If it has substantial reserves of gold (or foreign M. or securities) it can live beyond its earnings for a time, but a continuing loss of gold, etc., must be regarded as an urgent danger signal long before reserves are exhausted. If exports are insufficient to maintain the accustomed standard of living, the country must either adapt its buying and selling to its £ or adapt its £ to its buying and selling. The gold standard employed the first of these methods, the free exchange the second. With a free exchange there is a running balance; with the gold standard there is either a balance or a persistent approach to it. With a fixed (non-gold-standard) exchange adjustment is not 'automatic,' but dwindling reserves demonstrate the need for action. If the gold standard was automatic it was in the prompt 'calling of the tune,' e.g. the tune of temporary deflation and unemployment. The country could still refuse to 'dance' and, indeed, owing to the increasing rigidity of the United Kingdom wage and price structure before 1914, the working of the gold standard—towards prosperity as distinct from mere exchange stability—left much to be desired. After the Second World War exchange rates were fixed and the International Monetary Fund (*see BRITTON WOODS AGREEMENTS; ECONOMICS*) estab. to advise and assist member-countries to maintain these rates and, if change (beyond 10 per cent) proved inevitable, then to agree such changes with the country concerned. One I.M.F. (and Havana Charter) feature is specially notable, namely the provision that each country should ensure full employment within its own borders. If carried out vigorously this should mean a great steadyng of world trade at a high level. It is rather a method of avoiding the need for adjustment than method of adjustment. It represents a root and branch departure from gold standard ideas.

M. stops at frontiers. The United Kingdom exporter is paid by the United Kingdom importer. With a free exchange the £ changes size, so that what Britain sells buys what she buys. With the gold standard any gap not covered by loan or foreign M. or securities is filled by the universally acceptable import, gold. The payment for the gold makes a balance of payments but not a balance of trade. Gold (not being new production) tends to mark unemployment in the country exporting it, and a persistent export of gold leads to deflation and unemployment to adjust price structures downwards, to increase exports and diminish imports. The exporter is paid by the importer. The bill of exchange, the typical means employed to finance foreign trade, itself provides a good illustration of the operation of this principle. Importers in this

country are continually paying out £s on bills of exchange drawn abroad, and exporters are continually getting £s on bills of exchange drawn here (*see EXCHANGES, FOREIGN*).

Question of an International Currency.—M. is not international. Gold has some claim to the status of international M. but at most is mere 'M.-by-weight' and not true M. Serious proposals have, however, been made for an international currency, not a world M. to begin with but a single currency for the nations of W. Europe. The advantages of such a currency seem obvious, but there are disadvantages. A single currency would involve essential financial unity and a common budget could hardly be avoided. Again a single currency and no tariff or other barriers would allow, even drive, workers to go where most profit lay. To realise something of what is involved it is perhaps worth while to consider what might be done, short of a single currency. Suppose a new gold standard with all the world's currencies containing each an ounce of gold, and that, despite the rise in value, each unit retains its present name, i.e. £=dollar, franc, etc., or, if preferred, New-£ = New-dollar = New-franc, etc. Then the Englishman going abroad would get practically a dollar or a franc (actually a fraction less) for his £. Similarly a Frenchman going abroad would get a £ or a dollar for his franc and would know that an article marked £10 in a London shop or \$10 in a New York shop was a 10-franc article. Universal M. would of course go further than this and abolish all M.-changing at the frontier. The difference would be that whereas with separate Ms. each country would be striving to make ends meet, failure being exposed by loss of exchange parity, a single M. would enable any one country to lean on its neighbours for assistance in this unpleasant task. M. makes us 'members one of another,' and 'national M. is a bond providing effective if invisible frontiers.' Neither the Eng. wage-earner in 1913, nor perhaps his neighbour enjoying foreign dividends, realised that the benefit of these was far from being an exclusive perquisite and helped in fact to make possible the wage-earner's improved standard of living and his employment on more lucrative work. The 1949 tourist with his £50 allowance was made to see that what one Englishman spent abroad affected the interests of all Englishmen.

Savings in Relation to Employment.—A high degree of specialisation and world trade and travel became possible when barter was superseded by M. But this advance brought its own problems. Barter was a complete mutual transaction. But with the advent of M. the complete barter transaction is replaced by two half-transactions. The seller sells his product for M., holds his M. for a longer or shorter interval, and then completes the transaction by making his purchase. For the poor man the interval is necessarily short, but the half-transaction allows the wealthier to save and devote M. to the production of capital. It also

allows the wealthier man to postpone much of his buying indefinitely. 'The first weakness in the U.S. economy is that more people have a choice between spending now or waiting than has ever been the case in any other country' (*Economic Digest*, Aug. 1949, quoting Monthly Letter of the National City Bank of New York, June 1949). The highly developed modern world with its enormous capital wealth, owes its existence to savings collected from many sources and spent collectively in enterprise. At the same time the heavy unemployment of recent times is a reminder that there is no automatic regulator which ensures that the saving and the investment-spending keep step. Nowadays moreover M. saved may be spent in enterprise or it may buy secondhand stocks and shares, e.g. gov. stocks representing expenditure on past wars. In the first case the M. goes into the industrial circulation, as wages, etc., giving £ for £ employment; in the second case the M. goes into the financial circulation, giving employment only in a minor way. There is ample money for both purposes, but it is important to mark the distinction since it used to be assumed that the purchase of secondhand stock, either direct or through a savings bank, put M. into industry as surely as direct investment in enterprise.

In times of slump it is true that public opinion had misgivings whether saving did not tend to create unemployment. The advance of monetary science between the wars, for which Lord Keynes was so largely responsible, confirmed these misgivings and at the same time indicated the remedy. Savings can cause unemployment, but the duty of ensuring adequate spending in the interest of employment has now been accepted at the national, not to say the international, level (*see ECONOMICS*). We need no longer hesitate to save for fear of throwing our neighbour out of employment. The advantage to the State of a growing number of citizens with 'M. in the bank' requires no emphasis. Saving is the perfect antidote to inflation. The advantage to the individual is manifest: savings in the bank yield a real dividend year by year in sense of security, apart altogether from the monetary interest earned. For that security to be unassailable the value of M. itself must be guaranteed against depreciation, and that guarantee (as shown above) resides essentially in the limitation of its amount.

The more savings the more debt; but debt, subject to proper safeguards, is recognised as an essential part of the modern business structure. The more savings the more debt; except that the shareholder of a company is really a partner and only technically a debt-holder. The shareholder, as distinct from the debt-holder, has always escaped the stigma of usury and the censure of the Church.

The more debt the more savings. During the two world wars individuals grew richer and richer, with more and more M. in war loan, and at the same time

found themselves collectively getting poorer and poorer as the State sank deeper into debt. But it is here especially that 'perhaps the most useful approach is to regard M. as a claim.' It is manifestly easier to multiply claims, albeit perfectly good claims, than to multiply goods. It is important to note that, while to increase M. faster than production tends to inflation, there is nothing inflationary in an increase in the national debt which is matched by the will to save, although not by increased physical wealth.

Money Market.—If a bank is to be always in a position to meet its depositors' demands for notes and coin with so small a cash reserve as 10 per cent or so, it must be able to lend a good part of its M. where it can get it back at very short notice. The bill of exchange, maturing for settlement within a few months, and saleable at a discount at any time, has long met this requirement of the commercial banks; directly by the banks themselves buying bills of exchange, and indirectly by the banks lending their M. in the M. market, the short-term market for M. which comprises, besides the banks, the bill brokers and discount houses, together with the accepting houses or merchant bankers. The M. market buys and sells M. tomorrow for M. to pay, the price being interest or discount. With the assistance of the M. market a bank endeavours to arrange its portfolio of bills so that dates of maturity are suitably spaced. Short M. is also lent to the Stock Exchange. The bill of exchange finances overseas trade. By buying (discounting) bills of exchange the bill brokers, discount houses, etc., lend the M. which enables the exporter to obtain payment for his goods without waiting for the date when the foreign buyer has to settle the bill. Accepting houses and banks not only buy bills, but also for a consideration lend their names to first-class trade bills and so make them a safer and more valuable security commanding a finer rate of discount. Such bills are known as 'bank' bills.

Besides borrowing from the commercial banks, M. market funds are derived from direct deposits and from London branches of foreign and colonial banks, which often have considerable sums to spare for short periods. When the commercial banks are short of funds they obtain M. from the Bank of England not by direct borrowing but by calling in loans to the M. market and so forcing the market to borrow from the bank, at a higher rate.

Two wars have left their mark on the great London M. market, on 'Lombard Street' to use the name by which it is known the world over. The scarcity of commercial bills of exchange made the market operators ready buyers not only of the Treasury Bill (a three-months' Bill, now the chief instrument of govt. short-term borrowing) but also of govt. securities nearing their dates of maturity.

The commercial banks' loans to the M. market (M. at call and short notice) may amount to some 7 per cent of their deposits, bills discounted (including Treasury bills) to say 12 per cent, and

Treasury deposit receipts (which date from the Second World War) to upwards of 20 per cent; a total of 'quick assets' amounting, with cash and balances with other banks, to over 30 per cent of deposits. The greater part of these 'quick assets' bring the banks little more than 1 per cent interest. Reference to *The Times* 'M. Market' report will show that M. market rates of interest and discount are low generally. The advantages to international trade of such low-cost financing are obvious; they would be lost under the 100% M. proposals mentioned above. See also BANKS AND BANKING; BILLS OF EXCHANGE; BIMETALLISM; CURRENCY; ECONOMICS; EXCHANGES; FOREIGN MONIES AND EXCHANGE RATES; MERCANTILE SYSTEM; PAPER MONEY; NUMISMATICS.

See W. Bagshot, *Lombard Street*, 1873, 1915; G. Cassell, *The World's Monetary Problem*, 1921; A. Marshall, *Money Credit and Commerce*, 1923; H. Withers, *The Meaning of Money*, 1923; G. F. Knapp, *The State Theory of Money*, 1921; W. Leaf, *Banking*, 1926; F. Soddy, *Wealth, Virtue and Debt*, 1926; D. H. Robertson, *Money*, 1928; P. Eltzig, *International Gold Movements*, 1929; J. M. Keynes, *A Treatise on Money*, 1930, and *The General Theory of Employment, Interest, and Money*, 1936; R. G. Hawtrey, *Currency and Credit*, 1930, and *The Gold Standard in Theory and Practice*, 1947; J. P. Day, *The Money and Banking System of the United States*, 1930; *Report of the Macmillan Committee on Finance and Industry*, 1931; J. A. Hobson, *Poverty in Plenty*, 1931; J. H. Buchi, *Free Money*, 1933; I. Fisher, *100% Money*, 1933; R. J. Truptil, *British Banks and the London Money Market*, 1936; G. Haberler, *Prosperity and Depression*, 1937; Sir N. Angell, *The Story of Money*, 1938; S. E. Harris, *The New Economics*, 1948; F. Benham, *Economics*, 1948; A. H. Quiggin, *A Survey of Primitive Money*, 1949; and G. Crowther, *An Outline of Money*, 1919.

Money-Fossils, see NUMMULITES.

Moneylender. With certain exceptions, any one who acts as a M. must (a) register his name and address or addresses; (b) carry on his business only in his registered name and at his registered address or addresses; and (c) supply the borrower on request and on tender of expenses copies of all documents relating to the loan. Non-compliance with these statutory requirements (Moneylenders Act, 1900) renders a M. liable to fine, and, on a second conviction, to imprisonment with hard labour. The exceptions are banks, registered friendly societies (q.v.), pawnbrokers, building societies, insurance offices, and indeed any business the prime object of which is not the lending of money. A borrower who, not being an infant (see INFANCY), enters into a money-lending transaction must not expect that he will necessarily get the sympathy of a court of law. The Act of 1900 merely provides that a court may reopen a transaction and relieve the borrower from the necessity of paying more than a certain

sum of interest, fines, expenses, premiums, renewals, or other incidental items, where the transaction is 'harsh and unconscionable' or the interest, etc., excessive, having regard to the M.'s risk and all the circumstances of the case. The Money-lenders Act, 1927, prohibits the exactation of compound interest in loans by Ms. and any increase of the rate of interest by reason of any default on the part of the borrower (*see further under INTEREST*). This Act also provides that a M. shall take out an ann. licence—called 'a M.'s excise licence'—in respect of every address at which he carries on business, the duty on such licence being £15. Penalties are provided for taking out a licence in any name other than his true name or for other infringements of the statute. A licence will be granted only to a person who holds the necessary certificate from the petty sessional court of the div. in which the M.'s business is carried on, and the grounds on which a certificate may be refused are specified in the Act. They relate chiefly to character. Conviction for any offence under the Betting and Loans (Infants) Act, 1892, or the Moneylenders Act, 1900, may entail suspension or forfeiture of a certificate. This Act also imposes various restrictions on moneylending advertisements, the chief of these being that circulars may only be sent to persons in response to a written request for the same, and that newspaper advertisements or posters, etc., containing invitations to do business with a M. may be pub. only under the conditions prescribed by the Act. Legal proceedings in respect of money lent by Ms. may not be brought after the expiration of twelve months from the date on which the cause of action accrued. The Act exempts pawnbrokers' loans from the provisions as to certificates and limitation of actions. The Companies Act, 1929, provides that every company licensed under the Act of 1927, whenever it was registered or estab. as a place of business, must, in all its trade catalogues, circulars, showcards, or business letters, give specified particulars as to the names and nationalities of the directors. A borrower could, however, always count on getting relief or avoiding a transaction altogether if induced to enter into it by a false or fraudulent misstatement, and indeed a M. so acting is liable also to criminal proceedings. In the U.S.A. the law relating to the lending of money varies in the different states. All states have a legal rate, and a rate allowed by contract; the first varies from 5 per cent to 8 per cent; the second from 6 per cent to 12 per cent, while in this second case some states allow any rate. The penalty for usury varies also from fines to loss of principal and in some cases imprisonment.

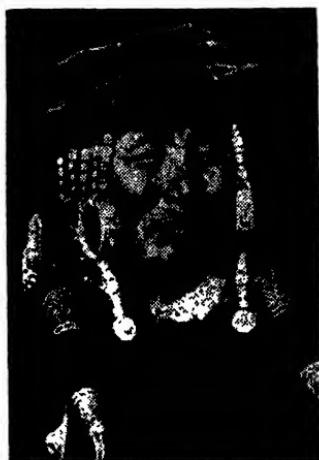
Moneywort, name given to two distinct plants: (1) order Primulaceæ, creeping Jenny or loosestrife (*Lysimachia nummularia*), has a creeping stem, heart-shaped leaves, short one-flowered stalks, and bright yellow flowers; (2) Cornish M., *see PENNYWORT*.

Mongolia (the country of the Mongols)

embraces a vast and indefinite extent of country in the interior of Asia between 38° and 53° N. lat., 84° and 124° E. long. Its length from E. to W. exceeds 1700 m. and its width from N. to S. 1000 m. Area 1,375,000 sq. m. Bounded N. and W. by Siberia, E. by Manchuria, S. by China proper and Sinkiang. It is divided into two parts, Outer M. in the N., now a republic under Soviet domination, and Inner M. in the S. and E. Inner M., with the exception of Jehol and parts of Chahar which have been forcibly occupied by the Jap. troops, is under Chinese control. Frontier incidents occurred in the 1930s, but in 1936 the Soviet Gov. of Russia agreed to the appointment of a boundary commission. The central portion is occupied by the Great Gobi, a vast tract of sand, small stones, and sparse vegetation. The country to the S.E. of the Gobi is more elevated and terminates in a high mt. range, which, beginning near the Hoang-Ho, runs N. for 500 m. then turns at right angles to the E., whence under the name of the Iushan Mts. it extends for some 600 m. until it turns N. again. The dist. S. of the Iushan Mts. contains fertile valleys, but further W. where it is surrounded by the great N. bend of the Hwang-Ho, it is again either arid like the Gobi or only fit for pasture ground. The E. part, extending nearly to the Yellow Sea, contains to the S. of the Leah-Ho rich meadow-land. The slopes of the Kingkhan Mts., a spur of which extends in a S.-easterly direction to the Hoang-hai, are well watered and in the S. part overgrown with pine, fir, oak, lime, and walnut trees. N.W. M. is also well watered but poorly wooded; near the boundary between M. and Siberia the country rises into the Altai Mt. chain. Rain is rare except near the great mt. ranges. The wealth of the Mongols consists in their great herds of horses and sheep, and, in the hilly tracts, of cattle. The Mongols proper voluntarily submitted to China to avoid destruction in their unsuccessful war with the Kalmucks in 1685, which cession has resulted in some development of resources and a transport trade with China and Siberia along the great caravan routes, the chief of which run from Kalgan and Kweih-wacheng to Maimaichin via Urga, and from Kalgan again through Kobdo to W. Siberia. Railways are projected from Urga to Kiakhta (170 m.) and to Kalgan in China (530 m.). Since 1917 motor-car services have been running across the Gobi during the summer, from Urga to Kalgan.

Under the provisional republican gov. of China (1912) a separate dept. was formed for the administration of M. and Tibet. The Russo-Mongolian agreement of 1912 resulted from a series of revolutions consequent on excessive Chinese interference. In 1915 the treaty of Kiakhta between China, Russia, and M. was signed, by which the Hlunkhia Lama was recognised as the ruler of Outer M., under Chinese suzerainty; in 1924, however, it became an independent republic in alliance with the Soviet Federation.

Chinese immigration has recently greatly increased in Inner M., resulting in a much greater degree of productivity; by means of irrigation even the fringe of the Gobi desert has been made to yield crops. So great was this immigration, that when in 1924 Outer M. became a republic, Inner M. became a part of China, administered by Manchuria. In that year, on the death of the last theocratic ruler of Outer M., there was a revolution, as a result of which the Mongolian People's Revolutionary Gov., organised on Soviet lines, was estab. The highest power is vested in a parliament (the Great Huruldui) which is elected by universal suffrage.



E.N.A.

A MONGOLIAN MATRON

The pop. is estimated at 550,000. In 1937 the Jap. set up a new autonomous gov. of Inner M., with its seat at Kalgan. The area dominated by this gov. is estimated to be 304,510 sq. km. and the pop. 2,136,000, of whom some 60 per cent are Chinese and the remainder Mongols. Japan secured exclusive mining rights in E. M., and rights to build railways in M. and Manchuria. Of Outer M. Urga (pop. 100,000), known since 1924 as Ulan Bator Hoto, is the chief centre of pop. and commerce, and here dwells the Kutukhta Lama, the third highest pontiff of the Buddhists. Other tns. are Uliassutai and Kobdo. The Mongols do not practise agriculture, but rear great herds of horses, cattle, sheep, and camels; hide, furs, wool, and horns are the chief exports. The country is rich in minerals, including gold and silver, but they are little exploited. A new independent republic was proclaimed in the dist. of Burga in 1929, Hailar being the cap. Tannu-Tuva (formerly Uryanthai) in the N.W. (cap. Krasny) is regarded by Russia as a separate protectorate. Its area is 64,000

sq. m. and its pop. 65,000. The Tuvinians are a Turkish people, mainly herdsmen, and cattle farmers. There are deposits of gold and asbestos. N. of M., between it and Lake Balkal, is the Buryat-Mongolian autonomous S.S.R. Area about 1,360,000 sq. m. Pop. 7,677,000. This, however, is a part of Russia proper.

M. has long been considered the world's chief theatre of evolution, and recent discoveries, especially those made in 1922, 1923, and 1925 by the Central Asiatic Expeditions, under Roy Chapman Andrews, have confirmed this opinion. These expeditions, sent by the Amer. Museum of Natural Hist., travelled over the Gobi desert in carts supported by camel caravan. Important discoveries in the W. Gobi included the fossil remains of various species of dinosaur, including the small *Protoceratops*, a 9-ft. species which is considered to be the ancestor of the giant *Triceratops* of Montana; nests of fossilised eggs of this dinosaur were also found. In the same strata, Lower Cretaceous or Upper Jurassic, were found skulls of a tiny mammal, the earliest mammal known. Other finds included fossil bones of the *Baluchitherium*, a giant rhinoceros of the Miocene period, when M. was probably fertile grassland, with a clement climate, the mastodon, amblypod, titanother, etc. Evidence was also found of late palaeolithic man, in the shape of chipped flints, egg-shell ornaments, etc. In the E. Gobi, in Inner M., fossils of mammals of the Upper Eocene period were discovered, also graves and worked copper mines of early historical times. Another expedition found, in 1923, Mousterian implements in the Ordos desert of Inner M. Discoveries made in N. M., by a mining engineer, 1912, led to a Russian expedition under P. K. Kozlov, 1921-25, which excavated burial mounds about 70 m. N. of Urga. The tombs showed Hellenic, Hanian, Scythian, Chinese, Siberian and Sarmatian influences. Skulls found seemed Aryan rather than Mongolian in shape. The tombs are believed to date from the Tang dynasty, about 2000 years ago. See also MONGOLS.

See J. Gilpin, *Among the Mongols*, 1888; V. Obrutschew, *Report of Journeys, 1892-1894*, in *Central Mongolia*, 1901; C. W. Campbell, 'Journeys in Mongolia' in *Geographical Journal*, Nov. 1903); K. Kozloff, *Works of the Expedition of the Imperial Russian Geographical Society in Mongolia and Khan (Tibet) during 1889-1901* (Eng. trans. in *Geographical Journal*, April, May, and June 1908); J. Hedley, *Tramps in Dark Mongolia*, 1910; R. C. Andrews, *Across Mongolian Plains*, 1921; A. S. Kent, *Old Tartar Trails*, 1925; R. Chapman Andrews, *The New Conquest of Central Asia*, 1933; H. Haslund, *Tents in Mongolia: Adventures and Experiences among the Nomads of Central Asia*, 1934, and *Men and Gods in Mongolia*, 1935; L. Forbath, *The New Mongolia*, 1936; and O. Lattimore, *Mongol Journeys*, 1941.

Mongolian Languages, see under URAL-ALTAIC LINGUISTIC FAMILY.

Mongols, people of Central Asia, living

chiefly in Mongolia (*q.v.*), and also in Sinkiang and Manchuria. They may be divided into the W. M. or Kalmucks and the E. M., and are a sturdy people with high cheek-bones, flat faces, straight black hair, and a characteristic 'mongolian fold' of skin over the inner angle of the eye. They are nomad herdsmen and dwell in tents, or *yurts*, taking unkindly to any other way of life. Formerly an energetic and warlike people, their acceptance of Lamaism has been largely responsible for their present pacific torpor. They emerge into hist. with the coming of Genghis Khan. He was occupied in conquests in the E. from 1206 to 1227, and it was his genius which for a time built up the fabric of a great Mongolian empire. At his death he divided his ter. between his sons; Ogotai received the country between the Irish and Lake Baikal, Jagatai the country between Bokhara, the Irish and Gobi; Tuli the land S. of the Baikal; and his grandsons Orda and Batu, Khwarezm, the region drained by the Jaxartes, Ural, and Oxus. Ogotai, with the help of Tuli, became emperor of China and put an end to the Kin and Sung dynasties (1234). Batu, after occupying Russia, seized the Hungarian cities of Pesth and Gran (1241), and in 1236 Mongolian troops overran Georgia and Armenia. Hulagu (Hulagoo, Ilulaku) Tuli's son, defeated the Persian assassins, crushed the caliphate of Bagdad, and took possession of Syria, together with Aleppo and Damascus, whilst the great Kublai Khan, another of Tuli's sons, estab. a line of emperors in China, which lasted from about 1275 to the final expulsion of his race in 1368. Meanwhile the M., or, to give them a more generic name, the Tartars, were establishing (about the year 1224) the Kipchak empire in S. E. Russia under Batu. The khanates of Astrakhan, the Crimea, and Kazan, and in Turkestan the khanates of Bokhara and Samarcand, were all held by M. Though the power of the Golden Horde or W. Kipchaks waned, that of the White Horde or E. Kipchaks—the inheritance of Orda, Batu's brother—grew apace, and in 1378 Toktunish, an E. Kipchak, became ruler of both hordes. But he had no sooner completed his Russian conquests than he was plunged into a bitter struggle with Timur, or Tamerlane, a Mongol chieftain, who had estab. a supremacy in Samarcand (1369). A wider meaning is sometimes given to the word when the term Mongolian or Mongol is used to include the whole yellow race, the N. M. including the Koreans and Jap., the Finno-Ugrians, E. Siberian Eskimos, and even the Amer. Indians, while the S. M. include the Chinese and Indo-Chinese, Tibetans and Malays, all of which races are believed to have had a common derivation. The word Tungus has been introduced to replace this use of M. For bibliography see under MONGOLIA.

Mongoose, or Mungoose, or Ichneumon (*from native mangus*) (*Herpestes griseus*), genus of small weasel-like animals, common in many parts of Asia, especially India, and in Africa. They form a sub-

family of the civet tribe. The largest species is the Egyptian Ichneumon. The common Indian M. is tawny or grey in colour, and about 17 in. long, excluding the tail, which is about 14 in. long. It is very voracious, and fights and kills even large and poisonous snakes with the utmost agility and daring, and for this service has been introduced into the W. Indies and other countries. It is readily tamed and makes a delightful though mischievous pet. Observers do not confirm the popular notion that the M. visits certain plants to counteract the effects of poisonous snake bites, which indeed are as fatal to it as to other animals.

Monica (332-87) was the mother of St. Augustine. She was the wife of Patricius, a pagan citizen of Tagaste, and converted both her husband and son to Christianity.

Monier-Williams, Sir Monier (1819-99), Eng. orientalist, b. in Bombay. He was educated at King's College, London, and Balliol College, Oxford. Prof. of Sanskrit at Oxford, he was chiefly responsible for the foundation of the Indian Institute. His publs. include *Hinduism* (1877); *Buddhism* (1890); *Brahmanism* (1891); and a *Sanskrit-English Dictionary* (1899).

Monifleth, burgh of Angus, Scotland, on the N. side of the firth of Tay. There are jute mills and machinery works. Pop. 3200.

Monism, philosophic system which attempts to reduce the universe to a single principle. It is thus directly opposed to dualism, between which and M. stands the monadism of Leibnitz. M. tends to reduce the universe either to a material principle, thus developing into a form of materialism, or into a mental principle leading to idealism and pantheism. The early Gk. philosophers were monists of the materialist school, postulating the sev. elements as the material cause of all things. Thus Thales took water as the first principle and Heraclitus fire. An important advance was made by the Eleatic philosopher Parmenides, who invented the epigrammatic formula, 'the ent (*ter*) is, the nonent (*ter* *o*) is not,' thus distinguishing the one which is from the many which become and are not. This theory was supported by Zeno, who sought to disprove plurality by his paradoxes of space, time, and number. In the stoic philosophy M. was a fundamental doctrine.

M. has been conspicuous in the thought of sev. modern philosophers, most of whom tend to the idealistic school. Spinoza, 'the classic type of pantheist,' attempted to reconcile the dualism of Descartes by relating mind and matter to one infinite, all-embracing, substance, God, and by regarding all else as but modes of that infinity. Hegel is perhaps the most distinguished of the idealistic school. Proceeding from the idealism of Kant, Fichte, and Schelling, he arrived at an explanation of matter, individuality, sensation, and will as forms of thought. Hegel's teaching was developed into positivism and the atheism of Strauss, Feuerbach, and Bruno Bauer. Schopenhauer and von Hartmann merge all finite

existence in the cosmic will. See also MATERIALISM. See A. Schopenhauer, *The World as Will and Idea*, 1844; K. R. E. von Hartmann, *The Philosophy of the Unconscious*, 1869; G. W. F. Hegel, *Philosophy of Mind* (trans.), 1894; T. Gompertz, *History of Ancient Philosophy* (trans.), 1901-12; and R. McKeon, *The Philosophy of Spinoza*, 1928.

Monitor, name for a number of lizards which include some of the largest forms. They are widely distributed throughout the E. hemisphere, and their habitat varies from dry sandy spots far away from the water to the marshy banks of rivers. The Nile M. (*Varanus niloticus*) is about 6 ft. long, with a long head and small rounded nostrils. An even larger species is the Ocellated M. of China and Siam. It preys on birds and smaller lizards, and, if attacked, defends itself fiercely.

'Monitor,' famous Amer. battleship, built by Ericsson, which on March 9, 1862, defeated the formidable *Merrimac* in Hampton roads. The essential and original feature was a circular turret, protected with 8 in. of iron, and revolving by steam on a central spindle. Two 11-in. smooth-bore guns pointed through the turret's port-holes with deadly effect. This device was applied in the R.N. to the *Royal Sovereign*, etc. The 'M' sank in a hurricane off Cape Hatteras.

The shallow draught of such vessels enables them to approach close in-shore and attack definite points on the coast. During the early days of the First World War a number of Brit. Ms. were employed off the coast of Belgium harassing the Ger. advance and preventing their taking Dunkirk and Calais. During that war Ms. were built to carry guns up to 15 in. These did great damage to Ger. shipping and largely rendered Ostend and Zeebrugge ineffective for offensive work. They were equipped for anti-aircraft work and threw shells as large as 12-in. Ms. were present at the famous attack on Zeebrugge, April 23, 1918. In the Second World War Brit. Ms. were used against enemy forces in Libya, and supported the invasion of the Normandy coast.

Monk, George, see MONCK.

Monk, Maria (c. 1817-50), woman of bad character who pub. *The Awful Disclosures of Maria Monk* in 1836 in New York, in which she alleged that she had escaped from the Montreal nunnery of the Hôtel Dieu. The book had a huge sale. She was eventually exposed and her story proved to be false.

Monk, see MONASTICISM; MONASTERY.

Monkey, unscientific name usually applied to primates, excluding man, the anthropoid apes, the marmosets, and also, as a rule, the baboons. Ms. are arboreal in habit, and are rarely found away from the warmer parts of Africa, Asia, and America. It is usual to classify the Ms. into two great families, the Cercopithecidae of the old world and the Cebidae of the new. There are many points of difference between those of the old world and those of the new. An important distinction is in the div. between the nostrils, which is invariably broad in new-

world Ms., while the nostrils open almost sideways. In the old-world Ms. the div. is thin and the openings of the nostrils tend downwards. No new-world Ms. have cheek-pouches, and the thumbs differ less from the other fingers; but of old-world Ms. some have cheek-pouches and others are without them. Most have a laryngeal or air pouch, and these are rare in the Amer. genera. But in many of these prehensile tails are highly specialised, though in some the tails are short or feeble. All old-world Ms. have the ischial callosities or pads, where the animal sits; these are always absent from the new-world Ms. See also CHIMPANZEE; ENTELLUS MONKEY, etc.

Monkey Flower, see MIMULUS.

Monkey-pot, see LECITHITIS.

Monkey Puzzle (*Araucaria imbricata*), hardy evergreen conifer, native of Chile, and varying from a few feet to 150 ft. in height. There is a variety with golden-tinted foliage.

Monk-fish, see ANGEL-FISH.

Mon-Khmer Language, see LINGUISTIC FAMILIES, ASTRO-ISLATIC LINGUISTIC FAMILY.

Monkhouse, Allan (1859-1936), Eng. journalist, dramatist, and novelist, b. in Durham. He became a dramatic critic and leader writer for the *Manchester Guardian*, and later contributed to that jour. a weekly article, 'A Bookman's Notes.' He wrote a number of plays, most of which were produced at the repertory theatres in Manchester, Liverpool, and Birmingham. The two best were *Reaping the Whirlwind* (1908) and *The Conquering Hero* (Aldwych Theatre, 1924)- this latter being a pacifist study. His novels, which included *My Daughter Helen* (1922) and *Farewell, Manchester* (1931), reflected the conflict between belief in business and sentimental Socialism.

Monkhouse, William Cosmo (1840-1901), Eng. poet and art critic, b. in London. His working life was spent in the offices of the Board of Trade, where he rose to assistant secretary in the financial dept. His poems include *Corn and Poppies* (1890), the *Dead March*, and *The Christ upon the Hill* (1893). As an art critic his independence is established by his *Life of Turner* (1879), *The Italian Pre-Raphaelites* (1887), *Leigh Hunt* (1887), and *British Contemporary Artists* (1899).

Monkland, New and Old, two adjoining pars. in N.E. Lanarkshire, Scotland, 14 m. N.W. of Airdrie, with coal- and iron-mines. Pop. (Old M.) 61,000; (New M.) 38,000.

Monk Seal (*Monachus albirenter*), true seal, common in the Mediterranean, and on account of its tractability easily trained to perform tricks.

Monkshood, see ACONITUM.

Monkswell, Robert Porrett Collier, first Baron (1817-86), Eng. judge, was called to the Bar in 1843. In 1852 he was returned to Parliament as a Liberal by Plymouth, his native city. Created attorney-general in 1863, he successfully engineered a bankruptcy bill in 1869, and two years later was appointed under Gladstone to the judicial committee of the

privy council. He was created a baron in 1885.

Monkwearmouth, par. in Durham co., England, partly in the bor. of Sunderland (q.v.). The church is famous for remains of Saxon architecture.

Montluc, Blaise de, see MONTLUC.

Monmouth, James Scott, Duke of (1649-85), leader of a rebellion against James II., was the natural son of Charles II., by Lucy Walters, b. at Rotterdam during his father's exile. The king loved the boy, and put him in the hands of Lord Crofts, and afterwards of the queen-dowager. In 1663 he was made duke of M., and two years later, on his marriage with the wealthy Scottish heiress, Anne of Buccleuch, was granted the dukedom also of Buccleuch. In 1673 he became captain-general of the forces. His beauty and engaging manner, his clemency towards



JAMES, DUKE OF MONMOUTH

the Covenanters at Bothwell Bridge (1679), his almost royal progresses through the W. and N.W. of England, and above all his Protestantism, a point in his favour of which Shaftesbury made full use, secured him a wide popularity. Yet when, yielding to Argyll's persuasion, he landed at Lyme Regis to raise an insurrection against James II., his appeal met with faint response. His undisciplined forces were hopelessly routed at Sedgemoor (1685), and nine days later he was beheaded (in a bungling manner) on Tower Hill. See E. D'Oyley, *James, Duke of Monmouth*, 1938.

Monmouth: 1. Municipal and (in conjunction with Newport and Usk), parl. bor., and co. tn. of Monmouthshire, England, at the confluence of the Monnow and the Wye, 17 m. S. of Hereford. It has smelting and tin-plate works. There is a well-known M. School (q.v.). Pop. 5000. 2. City and the co. seat of Warren co., Illinois, U.S.A., 27 m. E.N.E. of Burlington (Iowa); has manufs. of ploughs, pottery, soap, and cigars. Centre of a coal-mining and horse-breeding dist. Pop. 9100.

Monmouth, Battle of, victory gained in

1778 at M. Court House by the Amers. under Washington over the Brit. under Clinton.

Monmouth Beach, summer resort of M. co., New Jersey, U.S.A., on the Atlantic coast, 3 m. N. of Long Branch.

Monmouth School, founded in 1615 by Wm. Jones, at M. The Worshipful Company of Haberdashers is represented on the governing body. There are four leaving exhibitions awarded each year for Oxford, Cambridge, etc., and pupils are also eligible for the Meyricke scholarships to Oxford.

Monmouthshire, maritime Eng. co. lying on the Welsh border with a coastline of 22 m. along the estuary of the Severn and that part of the Bristol Channel that lies between the Wye and the Rummey. The coast is exposed to remarkably high spring tides, which rush up the Severn in a 'boro' from the Bristol Channel, rising at Chepstow sometimes to 60 ft. The S. part E. and W. of the Usk comprises the Caldicot and Wentloog levels, which are protected from the sea by sea-walls. N. of the Caldicot Level, between the Usk and Wye, the surface is undulating, rising here and there into bold bluffs and varied by knolls and dells, which have rendered the co. famous for its scenery, set off as it is by mts. to the N. and W., primitive churches, ruins of old feudal strongholds, such as Chepstow, Caldicot, and Raglan Castles, and grand eccles. ruins, such as Tintern Abbey and the Cistercian abbey at Llanthony. About 4 m. from Abergavenny is the remarkable peaked mt. called Pen-y-Val or Sugar Loaf (1856 ft.), Coed-y-Bwyyd, comprising woodland between Abergavenny and Usk; Skirrid Fawr, known locally as the Holy Mt., highest point 1596 ft. above sea level, with fine views of the Black Mts., the Usk Valley, and the Sugar Loaf; and over 2000 ac. of the latter have been recently presented to the public. Chief rvs.: Wye, Usk, Rummey, Ebbw, Avon-Llywd, and Monnow, the first two being famous for salmon and trout fishing. The Crumlin Canal branches from the canal connecting Newport with Brecon, at a point between Newport and Malpas, and skirts the Ebbw to Crumlin. The co. is rich in coal, and mining is the chief industry. There are numerous iron works, and limestone is burnt extensively, both for building purposes and for use in the iron works. There is a large aluminium factory at Rogerstone. Wheat is plentiful in the vales of the Usk and Wye and in the N. and E. Newport, the chief port, is connected by canals with the mining centres. M. is treated for many purposes as part of Wales, e.g. as far as the Anglican Church is concerned; but not for the assize courts. M. is divided into six hundreds and five parl. divs. (Abertillery, Bedwley, Ebbw Vale, Monmouth, and Pontypool), each returning one member, and Newport one member. Medieval M. (formerly called Gwent) was undoubtedly Welsh. The Act of Union of 1536 created the present co. out of divers Lordships Marchers within the

said Country or Dominion of Wales,' just as it did with Brecknockshire and Radnorshire, saying nothing whatever about taking it out of Wales. Because, however, M. was 'the nearest part of Wales to London' (George Owen, the Tudor historian), it was brought under the jurisdiction of the courts of Westminster in certain matters, while separate courts were provided for the rest of Wales. Hence originated the use in official documents of the term 'Wales and M.'—a misleading term perpetuated in some modern Acts, though without logical justification, since in fact they treat M. as part of Wales. M. is in practice legislatively included in Wales for almost every purpose, from education to coal-mining. An old Act of 1649 explicitly includes M. among the Welsh cos. Though reduced by compulsory (Eng.) education, the percentage of Welsh speakers in 1931 (the last census) was higher in M. than in Radnorshire. The recent report of the Local Government Boundary Commission suggests no boundary changes for M., but lists it among the Eng. cos. Its justification for doing so is that M. was so listed in the schedule to the Local Government Act of 1933 (though the Act of 1929 included it with Wales). Area 546 sq. m. Pop. 434,⁸⁰⁰ T. Richards, *South Wales and Monmouthshire, 1949*.

Monnikendam, fishing vil. in the prov. of N. Holland, Netherlands, on the IJsselmeer, 12 m. N.E. of Amsterdam. Its old bell-tower and weigh-house and the church of St. Nicholas are notable. Pop. 3000.

Monnoyer, Jean Baptiste (1635–99), Fr. painter b. at Lille, who specialised in the painting of fruit and flowers. He was employed by the famous garden architect, Le Brun, to decorate the palace of Versailles, invited to England by the duke of Montague to embellish his house (the former Brit. museum) with examples of his art. The very striking decorations were, however, destroyed when the mansion was demolished to allow of the erection of the present building. M. also decorated sev. other historic mansions of England. There are sev. of his flower pieces in Hampton Court Palace. He etched a collection of his own designs which was pub. in a folio vol.

Monochætum, genus of the evergreen flowering shrubs (family Melastomaceæ) bearing large panicles of rose, red, mauve, or purple flowers.

Monochord, appliance invented by Pythagoras for studying musical intervals by means of a movable bridge under a single string stretched over a sound-board by a weight. From it the musical instrument of the same name, a sort of one-stringed guitar, was evolved, and also the 'nun's fiddle.' The clavichord was an application of the same principle, manipulated by a keyboard.

Monochrome, painting executed in imitation of bas-reliefs, in tints of one colour only, relieved by light and shade. In photography, isochromate plates are used for the correct rendering of colours in M., and there is a simple means of

ascertaining what light-filter should be used for each brand of plate.

Monocotyledon, plant with one cotyledon (q.v.) or seed leaf (e.g. wheat, tulip), as distinguished from a Dicotyledon (q.v.) (e.g. bean, carrot, dandelion). This distinction is the main basis of two great divs. of the Angiosperms, the group which comprises the majority of all flowering plants. In the M. the radicle or rudimentary root usually remains undeveloped, but throws out roots from its crown. In the Dicotyledon it usually elongates and forms a primary root or tap. The stem of Ms. has no central pith or separate bark, and the whorls of the perianth occur in threes. But, as a rule, the most visible and easily recognised distinction is that the leaves are parallel veined except in a very few cases, notably the black bryony, arum, and herb-Paris. Ms. are separated into three main divs.: (1) Spadicifloræ, flowers arranged on a spadix and frequently enclosed by a large spathe (e.g. arum); (2) Petaloïdeæ, with petaloid perianth (e.g. lily or daffodil); (3) Glumiferæ, perianth absent and flowers borne in spikelets in the axils of scales or glumes (e.g. sedges and grasses).

Monod, Adolphe (1802–56), Fr. Protestant divine, b. in Copenhagen. He studied at Paris and Geneva, and in 1825 founded a Protestant church in Naples, of which he was pastor until he went to Lyons in 1827. He was prof. in the theological college of Montauban in 1836, whence he removed to Paris in 1847 to preach at the Oratoire. He pub. various vols. of sermons, one of which, *La Créditibilité de l'Incrédible*, appeared in 1844. See life by P. Stapfer, 1898.

Monod, Gabriel (1844–1912), Fr. historian, b. at Ingouville near Le Havre. He studied at Havre and Paris, and afterwards visited Italy and Germany for research work. In 1868 he returned to France, and was appointed director of the Ecole des Hautes Etudes, and in 1880 entered the Ecole Normale, where he became prof., a post which he held till 1901. Wrote on medieval hist., and a bibliography of Fr. hist. (1888). He founded the *Revue historique* in 1876.

Monodon-Monoceros (sea unicorn), see NARWHAL.

Monogenetism, see under LANGUAGE.

ORIGIN OF.

Monogenetism, generally accepted theory in ethnology (q.v.) which regards man as having sprung from one primary form, as opposed to polygenetic views. Monogenists may be divided into three schools: (1) *Adamite*, which accepts the Mosaic doctrine literally, with a measure of evolution to explain the existing varieties; (2) *Rational*, which applies evolution and biological laws generally to man as to other organisms; and (3) *Intermediate*, which tries to harmonise the first two.

Monogram (Gk. μονος, sole, and γραμμα, a letter), cipher or character formed by an interlacing of letters and intended as an abbreviation of a name. Ms. were not uncommon on Gk. and Rom. coins, and also appear on A.-S. coins, especially those of King Alfred, and upon seals. In

later times Ms. were often used by printers and engravers on the title pages of books.

Monohydroxysuccinic Acid, see MALIC ACID.

Monolith (Gk. μονός, single; λίθος, stone), stone block or column, usually a pillar of great size and monumental in purpose. Some, however, are natural stones, e.g. the Buck Stone, Staunton, in the Forest of Dean, while others are the sole remaining stones of megalithic monuments; others are hewn obelisks, such as may be seen in Egypt. Those in Egypt are dated approximately to 3000 years B.C., or like those of Peru are of the twelfth century or even later. Certain Ms. are boundary marks. Some in Britain are associated with burials of the Bronze Age. In most instances there is no indication of date or purpose. Often the worship of stones persisted in Europe into the Christian period. (*See also MENHIR.*) In Baalbek (q.v.), an anct. Syrian city, is the largest cut stone in the world, weighing 1500 tons. The great statues of Pharaoh Akhenaten at Karnak may be regarded as Ms. Ms. of considerable size were common to both the Inca and pre-Inca architecture of Peru (*see also PERU, Ancient Civilisation of the Incas.*). One of those at Cuzco is 27 ft. long, 15 ft. wide, and 12 ft. thick. The stones in Peru vary as to their geological composition, according to the region. Among the beautiful ruins of Mitla (q.v.), Mexico, are some great monolithic columns. Prin. among the sculptured stone objects preserved in the national museum of the city of Mexico is a famous calendar stone of the Aztecs or sun-stone, a beautiful and massive M. of carved basalt, circular in form and 12 ft. in diameter. The stone was both a sun-dial and a calendar, such as the Egyptians and the Chaldeans used, and the procession of cyclical animals carved on it has given rise to the supposition that the chronological system which produced the stone may have had some connection with Chinese and Indian astronomical systems. *See R. Enoch, The Republic of Central and South America, 1922.*

Monongahela: 1. Riv. of U.S.A., in Virginia and Pennsylvania. It is a trib. of the Allegheny, which it joins at Pittsburgh to form the Ohio R., and is navigable as far as Morgantown. Length 300 m. 2. City on the M. R., in Washington co., Pennsylvania, U.S.A., 23 m. S. of Pittsburg. It lies in a fertile region rich in coal, the mining of which is the princi. industry. Pop. 8900.

Monophysitism, heresy which arose in the fifth century as a reaction against Nestorianism, teaching that in Christ there was but one nature. Its effect was to deny the humanity of Jesus. It was anathematised at the council of Chalcedon (451), but the decisions caused a great schism. Nearly the whole of Egypt refused to accept the decisions of Chalcedon, and has remained heretical to the present time.

Monoplane, see under AEROPLANE.

Monopoli, tn. in the prov. and 25 m.

S.E. of the city of Bari, Italy, on the Adriatic. It has a cathedral and a fortress built in 1552. It exports wine and olive oil, and manufs. woollen and cotton goods. Pop. 23,000.

Monopolies. The term monopoly literally means single or sole selling, and is so used in Aristotle's *Politica*, where a monopolist signified one who bought up the whole of a commodity so as to be the sole holder of it, and have the power of selling it at his own price. In this specialised sense it is clearly the same thing as a modern trust or combination to 'corner' an article. This is the root principle of all M. at all periods, though it may not be in accordance with the precision of economic language to speak to the owner of urb. rents as being in the enjoyment of the sole right to sell tenancies, or a railway company (before nationalisation) of the exclusive right to sell transit or travelling facilities. Again, though the effect of all M. is the same in point of exclusive right of commercial dealing, modern writers always distinguish between natural and artificial or legal M., a distinction detailed below.

Most anct. and civilised legal systems have endeavoured in one way or another, however ineffectually, to put some kind of a veto on M., e.g. the code of Zeno punished the monopolist by confiscating his goods and sending him into perpetual exile. In England legislation against M. goes back to the reign of Elizabeth, and so great was the abuse of the royal power of granting M. that in 1639, after quarrels between Parliament and the king, they were finally abolished by statute. The problem in England was always aggravated by the conflict between public utility and the anct. prerogative of the Crown (q.v.) to regulate all matters of trade. The privileges and exclusive rights of trade granted for a pecuniary consideration to merchants by the Norman kings, and abused by later monarchs (especially the Stuarts, who used them as convenient levers of political favouritism), furnish the most obvious example of the artificial or legal M., or M. which do not arise from the free play of economic forces. It was against artificial M. that past legislation in England was always directed, though with the advance in social ideas it became evident that the evils of natural M.—i.e. where a variety of circumstances of economic significance combines to nullify the ordinary effects of competition—were hardly less real, with the result that modern legislation has been active in securing monopoly values to the community, partly by facilitating the municipalisation of certain utility services (*see MUNICIPAL TRADE*), and by nationalisation of industries such as coal, gas, and electricity. Queen Elizabeth frequently granted M. to her favourites for dealing in the universal necessaries of life, e.g. coal, salt, vinegar, and leather; but it was not till the last year of her reign that a Bill, introduced by Lawrence Hyde, received such great support from an otherwise pusillanimous House that the queen was obliged to yield. Yet notwithstanding

her concessions many M. still existed or were newly granted. Prior to these concessions the matter came before the courts (*The Case of Monopolies*), which were disposed to declare M. void on the common law ground that they were in restraint of trade, for in the above case (royal grant of sole right to sell playing cards) it was said that every monopoly had three inseparable incidents, the raising of the price, the deterioration of the commodity, and the impoverishment of workers and others. The only exception which the courts were inclined to make was in favour of the royal grant of letters patent for the exclusive privilege of trading in things introduced or invented by the grantee himself, or where the grant was apparently beneficial to the community. The Act of 1622, however, declared all M. void except those granted by letters patent for the sole working, for fourteen years, of any new manuf. to the 'true and first inventor thereof,' and this statutory provision is still the foundation of the present law as to patents for invention. Finally, in 1639, as a result of the ineffectiveness of the above Act to check the royal grant of M. to corporations, all legal M. (except patents for inventions) were abolished. Analogous to patents for inventions is the monopoly conferred by copyright, a right which has recently been considerably strengthened (see **COPYRIGHT**) in favour of authors.

If in the past England has not been immune from the evils of legal M., she has at least been free from one notoriously oppressive form of artificial monopoly, that of the revenue farmers or middle men to whom in various countries at various periods was leased, in return for a fixed sum, the right of collecting for their own use certain of the ordinary taxes. The system prevailed in anc. Rome, e.g. when the prov. of Asia fell to the Romans. C. Gracchus enacted that the most exorbitant direct and indirect taxes should be put up to auction for that prov. as a whole, the consequence being the rise of an association of capitalists of colossal magnitude (T. Mommsen, *History of Rome*, 1854). In its way no less oppressive was the monopoly under the old monarchical regime of France, by which the 'farmers-general' obtained from the gov., in return for a fixed payment into the Treasury, the right of collecting certain branches of the revenue.

Natural M. are divided into three classes by Prof. Hobhouse: (1) Land M.; (2) M. valued from industries in which competition is inapplicable, e.g. gas (which is now a monopoly of the state) and water supply, tramway service, etc.; and (3) state M., e.g. the licence to deal in intoxicating liquors (see **LICENSING LAWS**). To this classification might be added those partial M. noticed by Mill, where a kind of monopoly price in the shape of 'superiority of reward' is obtained by workers in trades or professions where an uncommon degree of integrity is requisite, or a high degree of confidence reposed in the workers, e.g. goldsmiths, physicians, lawyers, etc. Mill's assertion that the superiority of

reward 'is not the consequence of competition but of its absence' is only a paradoxical way of saying that the demand is great but the supply small.

As to how far legislation has endeavoured to mitigate land M. see **INCREMENT VALUE DUTY; LAND; LAND LAWS; LAND TAXES; LIBERALISM**. However serious the blows Liberal or Socialistic legislation has dealt to private M. and individualism, a still more serious blow, in the opinion of anti-Socialists, is threatened by the mere substitution of a state monopoly, and nowhere more so than in the sphere of municipal trade (*q.v.*). Nevertheless the anti-Socialist and anti-municipal trader finds himself confronted by the dilemma of the 'trust' or huge combination of capital, whether national or international, which is designed to secure control of a trade or manuf. with the double object of economy in production and arbitrary profits.

Modern Tendencies—Regulation of Industry in the United States.—The control of monopoly and quasi-monopoly assumes crucial importance in periods of economic depression, or in periods of inflation no less than in wartime. Monopoly has flourished more conspicuously in the U.S.A. than in most other countries; but even Amer. experience of control is inconclusive. The Sherman and Clayton anti-trust laws (*q.v.*) were failures. M. continued to spread, and the sphere of 'free competition' to narrow. The Acts almost fell into disuse or were revived to check some especially large and menacing combine. Roosevelt's 'New Deal' ended this nerveless 'trust-busting,' when the gov., accepting the large corporations, began to intervene, not with penalties, but by creating a permanent machinery for the regulation of industry by the administration. But the National Industrial Recovery Administration (N.I.R.A.) lasted only two years, during which time there was a distinct increase in monopolistic practices and restraint of trade. Almost all the N.I.R.A. codes provided for the control of prices and, generally, such provisions were evaded. The increase of prices and the hostility of consumers would probably have brought N.I.R.A. to an end even had it not been declared unconstitutional by the court. Criticism of the Act emphasised the antithesis between the desire for 'free enterprise' professed by the manufacturers, and the enormous pressure towards restrictive regulation exerted when they acted as a group. It is therefore to be inferred that if all industries pursue restrictive policies all suffer in the long run; and that the advantage derived if a single industry pursues a monopolistic restrictive policy is lost if all do so. Even while N.I.R.A. was in operation other Acts were being passed to give the administration greater power to intervene in the internal affairs of companies. The Public Utility Holding Company Act was carried against strenuous opposition in 1935. By that Act all companies in the public utility and steel industries had to register with the Securities and Exchange Committee.

which was empowered to simplify their structure so as to restrict each to a single integrated process. This Act was followed by an experiment in an entirely different method of state control—gov. ownership and public corporations in competition with private enterprise. With the Tennessee Valley Authority, and similar hydro-electric schemes, the gov. entered the industrial field proper in a big way, one of the main reasons advanced being that such schemes would promote employment. The reaction from N.I.R.A. was shown by a campaign for a new trial of the old anti-trust laws. The Temporary National Economic Committee, the so-called monopoly investigation, reporting in 1948, revealed the widespread growth of combination in the U.S.A. The view was taken that a less corrupt application of the existing anti-trust laws might provide a solution. Little, however, was done up to the entry of the U.S.A. into the Second World War. The Amer. type of war control was developed from the industrial and political experience of the preceding decade. In Britain the war controls were almost exclusively in the hands of former directors of the largest firms, and little was done to limit the power of the larger combines. In the U.S.A., on the other hand, a direct attack was made on various trusts, and wartime controls were used to reduce monopoly rather than to strengthen it. But the development of control in America was not founded on any clear theory. The solutions formulated and the measures adopted were empirical, even opportunist, though the broad line of development from the attempted distant control by the early anti-trust laws to the direct participation by the administration in the industrial field is clear enough.

Monopolies and Restrictive Practices (Inquiry and Control) Act, 1948.—For the purpose of checking M. and restrictive arrangements in industry and trade, which are held to be detrimental to the public interest, the gov. introduced legislation in 1948 to set up an independent monopoly commission to determine whether monopolistic conditions exist in particular industries referred to it for investigation by the Board of Trade and, if asked to do so, to decide whether the conditions investigated are against the public interest. When this second and more searching inquiry is made the report of the commission must be pub., and various ministers will be empowered to make orders protecting the public interest when a report concludes that harm is being done. The Act, however, excludes all the restrictive organisations of trade unions and nationalised industries. The commission is empowered, when investigating conditions in connection with particular classes of goods, to report on such restrictive practices as price maintenance arrangements, boycotting of particular retailers, or output quotas. The Board of Trade may order the omission from the commission's pub. reports of information, e.g. trade secrets, or the location of minerals, which might damage traders' interests. See also

CARTEL; TRUST. See A. A. Cournot, *Recherches sur les principes mathématiques de la théorie des richesses*, 1838; R. T. Ely, *Monopolies and Trusts*, 1912; F. Y. Edgeworth, *Papers relating to Political Economy*, 1925; F. Zouton, *Problems of Monopoly and Economic Welfare*, 1930; and R. Triffin, *Monopolistic Competition and General Equilibrium Theory*, 1941.

Monorail, or runway, is the name given to a device which has wheels running upon a single rail and is used to carry relatively light loads, generally about a warehouse or the depts. of a factory. Often a lifting tackle is incorporated. In some instances the wheels run on an ordinary type of light, bulb-headed rail, and in others they are arranged to travel on both sides of the bottom flange of an I section beam, the rail in each case being overhead. When the machine is operated by electricity it is known as a telpher, a name devised by the inventor, Prof. Fleeming Jenkin, in 1882, from the Gk. words *τίλθε*, far, and *φέρω*, to carry. An up-to-date model consists of a bogie, running on an overhead rail, and driven by an electric motor which takes its current from a live rail running alongside the track. Attached to the trolley is a receptacle to carry the load, which may be as much as five tons. Telphers can be controlled by an attendant, or they may be entirely automatic; their operating costs per ton m. are extremely low. Mechanically propelled vehicles to run on a single line laid on the ground and to carry passengers have been considered by inventors, but, so far, have not become a practical proposition. This type of M. relies for its lateral stability upon some form of gyroscope included in its design. On the other hand, passenger cars having streamlined bodies suspended from a single overhead rail have passed somewhat beyond the experimental stage in one or two instances on the Continent.

Monotheism (Gk. *μόνος*, only, and *θεός*, God), belief in one only God as the ruler of the universe. Opposed to polytheism, which worships many gods, manifested in physical, human, or animal forms, it claims distinction from systems of moral dualism by asserting the ultimate supremacy of good over evil. It differs from deism (q.v.), for whereas the latter has come to mean a belief in one God accompanied by a rejection of revealed religion, this is not so with M., which is invariably associated with revelation. Many hold that revelation teaches that primitive man was monotheistic. The Jewish and Mohammedan religions are strictly so. Anti-Trinitarians insist that the doctrine of the Trinity prevents Christianity from being monotheistic, though the creeds lay much stress on M. See A. Lang, *The Making of Religion*, 1898, and *Myth, Ritual, and Religion*, 1906; N. Soderblom, *Das Werden des Gottesglaubens* (2nd ed.), 1926; and W. F. Albright, *From the Stone Age to Christianity* (2nd ed.), 1946.

Monotheletism (Gk. *μονοθελία*), heresy which arose in the seventh century. M. taught that Christ had but one will, whereas the Catholics held that though

Christ's personality was one, yet He had two wills (according with His twofold nature, human and divine), which were, however, always in perfect harmony. The hist. of this heresy shows that it arose out of Monophysitism (*q.v.*). For when the Emperor Heraclius asked Sergius, the Monophysite patriarch of Constantinople, how that sect could be reconciled to the Church, Sergius said it could be held, without prejudice to the authority of the council of Chalcedon, which had condemned the Monophysites, that, after the union of the two natures in Christ, there was but one will and one operation of will (M.). In 630 Heraclius accordingly issued an edict requiring acceptance of this tenet, but in 636 Sophronius, patriarch of Jerusalem, assembled a council and condemned M. Sergius adhered to his old opinion, and in 639 drew up a formula of faith. The same year Pope John IV. in a council at Rome, rejected the formula, and condemned M. M. was again condemned in the Sixth General Council, at Constantinople (680). The Lebanese Maronites embraced M., but were reconciled to the Church in the late twelfth century. For full particulars of the conflicts of the seventh century see article 'Monothelitism' in *The Catholic Encyclopedia*.

Monotremata, order or sub-class of mammals, and containing only three species, the *Ornithorhynchus* and the *Echidna* and *Precidina*, spiny ant-eaters. The young are hatched from eggs and are fed on milk secreted not by mammae, but on a bare patch of the mother's skin. They have features which seem to make them intermediate between reptiles and the higher mammals. They have only one aperture for the urinary, genital, and intestinal canals. The mammary glands are well developed. Teeth, if present, consist of four horny plates. In various respects they approach birds and to a certain extent connect mammals with reptiles. Darwin thought that the earliest mammals in some respects resembled M. See MAMMALS.

'Monotype,' see TYPE-CASTING AND TYPESETTING MACHINES.

Monreale, city in the prov. and 5 m. S.W. of the city of Palermo, Sicily. It is an archiepiscopal see, and its fine cathedral dates from the twelfth century. It has a large trade in corn, oil, fruit, and almonds. The massure known as the 'Sicilian Vespers' (1282) began on the road between Monreale and Palermo. Pop. 24,000.

Monro, Sir Charles Carmichael (1860-1929), Brit. soldier, youngest son of Henry M., of M. family of Craiglockhart. In 1879 he joined 2nd Foot (W. Surrey regt.). He commanded the 13th Infantry Brigade, Ireland, 1907-12, and became major-general, 1910. With London territorial units till 1914, he went with 2nd Div. to France. Lieutenant-general 1915. In 1915 he was given command of the First Corps, and when the Third Army was formed he was its commander. Soon after this he succeeded Sir Ian Hamilton as commander-in-chief in Gallipoli and

conducted the evacuation. From 1916 to 1920 he commanded the Indian Army, being made a general in 1917. He became a baronet in 1921, and was governor of Gibraltar from 1923 to 1928.

Monroe, James (1758-1831), fifth president of the U.S.A., son of a carpenter and mason, was b. in Westmoreland co., Virginia. He was educated at William and Mary College, but had hardly finished his education when, in 1776, he entered the army. Soon afterwards he joined Washington's army as lieutenant, taking part in the engagements at Harlem Heights, White Plains, and the attack on Trenton. He then became a captain of infantry (1777-78), fighting at Brandywine, Germantown, and Monmouth. He then temporarily abandoned a military career for law studies under the direction of Jefferson. In 1780 he was nominated military commissioner for Virginia, in 1782 elected to the Virginia Legislative Assembly, and in 1789 became a member of Congress. In 1790 he became a senator of the U.S.A., and four years later was sent by Washington to Paris as Amer. plenipotentiary. President Washington recalled him in 1796, as a result of his observations on the Jay Treaty negotiations over Amer. vessels. In 1799 he was made governor of Virginia. In 1803 he was sent by Jefferson as envoy-extraordinary to negotiate the purchase of Louisiana. The next four years he was at London and in Spain. In 1811 he became secretary of state for foreign affairs, secretary of war 1814-15, and on March 4, 1817, president in place of Madison. His affability and moderation rendered him highly popular with both Democrat and Federal, and in 1820 when he ran for President again he lost only one vote in the electoral college. The chief event of his administration was the controversy over the admission of Missouri to the states at a time when the question of slavery agitated the whole country. In 1822 M. declared in his annual message that the independence of the Hispano-Amer. republics, which for sev. years had been endeavouring to shake off the European yoke, must be maintained at any price, a declaration which has since become celebrated as the 'Monroe Doctrine' (*q.v.*). He retired into private life in 1825, but subsequently served as a member of the Virginia Constitutional Convention until ill health compelled him to retire in 1829. See S. M. Hamilton (ed.), *The Writings of James Monroe Inclusive: a Collection of his Public and Private Papers and Correspondence, 1898-1903*, and G. Morgan, *The Life of James Monroe*, 1921.

Monros: 1. Co. seat of Ouachita par., Louisiana, U.S.A., on the Ouachita R., 76 m. W. of Vicksburg, Missouri. It has a large trade in cotton, and manufs. cotton compresses and cotton-seed oil. Pop. 28,300. 2. City and co. seat of M. co., Michigan, U.S.A., on the Raisin R., 2 m. from Lake Erie; 35 m. S.S.W. of Detroit. It has flour, lumber, and paper mills, canning factories, furniture and box factories, and extensive nurseries. Pop.

18,500. 3. City and co. seat of Green co., Wisconsin, U.S.A., 37 m. S.W. of Madison; has manufs. of dairy products, lumber, and iron goods. Pop. 6200.

Monroe Doctrine, one of the most important political declarations in modern times, is remarkable in that it is not embodied in an Act of the U.S. Congress, is not part of the U.S. Constitution, and is not part of the body of international law. President Wilson epitomised it thus: 'The Monroe Doctrine was proclaimed by the U.S.A. on her own authority. It always has been maintained and always will be maintained upon her own responsibility.' In brief, the M. D., backed by all the resources of the U.S.A., says to all the rest of the world: 'Hands off the Amer. hemisphere.' It was adumbrated in the farewell speech of George Washington, the first President of the U.S.A., and by Thomas Jefferson, the third, but really came to a head during the administration of President James Monroe. The young republic had always feared that powerful European nations might establish colonies in the W. hemisphere, and so prove dangerous neighbours. This was especially marked during Monroe's service.

Under the leadership of patriots like Simón Bolívar and José de San Martín, one after the other of the Sp. colonies in S. America revolted and set up as independent nations. Most of them were republics, which were quickly given recognition by the U.S.A. The Portuguese colony of Brazil also revolted and set up an imperial regime. This gov. also was recognised by the U.S.A. But in Europe the Holy Alliance of Austria, Russia, and Prussia viewed with misgivings these popular risings, and even discussed the advisability of helping Spain to subdue her former colonies in America. George Canning, Brit. foreign minister, unwilling to see these colonies go back to Spain, made a proposal to James Rush, Amer. minister in London, to the effect that he wanted the U.S.A. and Great Britain to issue a joint declaration against any interference with the new Lat.-Amer. republics. President Monroe, advised by former Presidents Madison and Jefferson, was willing to join Great Britain in this, but changed his mind, on the advice of his secretary of state, John Quincy Adams, afterwards himself a president of the U.S.A., and insisted that the U.S.A. should act alone. One reason for this was that the Russian tsar had issued a ukase warning foreign vessels not to come within a hundred m. of a part of the Pacific Coast of the N. Amer. continent which Russia did not possess, although at that time it did own Alaska, which was afterwards sold to the U.S.A. Adams wrote to the Russians that the Amer. continents were henceforth not to be considered as subjects for future colonisation by European powers. In Dec. 1823, therefore, President Monroe signed a message largely written by Adams, which has since become known as the M. D. He not only set forth the view expressed above to Russia, but with an eye on S.

America he declared that the U.S.A. had no interest in European wars, but warned European powers that any attempt on their part to extend their system to any portion of the W. hemisphere would be considered as dangerous to the peace and safety of the U.S.A. His gov. would not seek to interfere with any existing colonies or dependencies of European countries now held in the W. continent, but could not allow any interposition of European powers for the purpose of oppressing or controlling any of the newly set-up Lat.-Amer. govts. This plainly told the members of the Holy Alliance that they would not be allowed to make war on Spain's lost colonies, and, further, that no European or extra-Amer. power would be allowed to secure Amer. ter. in the future, either by conquest, purchase, or treaty. Since that time in every international agreement made with the U.S.A. that country has always incorporated a reservation that nothing in the treaty of paper shall be considered as infringing or revoking or weakening the M. D. This doctrine has been reiterated in set terms by nearly every president who has succeeded Monroe.

It was strongly invoked against France in 1865. Taking advantage of the Amer. civil war the Emperor Napoleon III. sent Fr. troops to Mexico and set up a Mexican empire, with Prince Maximilian of Austria as ruler. As soon as the civil war was ended the U.S. Gov. sent a sharp message to France, and was prepared to use its armies and navy to enforce it. But the Fr. withdrew their troops, the people revolted, Maximilian was shot, and the Mexicans once more ruled Mexico. In 1895 it was again invoked in the boundary dispute between Venezuela and Great Britain. The serious situation thus created was ended by the wise statesmanship of Lord Salisbury. The general respect for the M. D. in the nineteenth century was due less to fear of offending the U.S.A. than from the realisation that Great Britain, with its immense naval strength, was a powerful if silent supporter of the Monroe principles; though, in the reaction after 1918, there grew up a feeling that the policy would gradually lose significance in the U.S.A., because there was no longer any possibility of a serious threat from an exhausted and supposedly democratised Europe. The doctrine underwent a marked extension in the first quarter-century preceding the First World War, a period which seemed to indicate the development of Amer. imperialism through intervention in the internal affairs of the Lat.-Amer. states. The so-called Roosevelt corollary to the M. D. was first enunciated in 1904 and was exemplified by that president's action against Colombia over the Panama Canal and his intervention in Cuba to keep internal order; and Lat.-Amer. fears of Amer. imperialism were only lessened, though by no means dispelled, when the U.S. Gov. supported their proposal at The Hague in 1907 that creditor states should intervene in the affairs of debtor states only if the latter

declined arbitration. This expanded interpretation of the M. D. was not repudiated by Taft or Wilson, as was shown by Amer. intervention in Haiti. It became evident, however, that something had to be done to reassure the Lat.-Amer. states that the U.S.A. did not intend to use their powers so as in effect to create any kind of hemispheric protectorate, and during the centenary of the Monroe message secretary of state Hughes formally stated that the U.S.A. had no such intention and that it was 'part of our policy to respect the territorial integrity of the Latin-American republics.' In a memorandum prepared by under-secretary Clark of the Hoover administration referring to the Roosevelt corollary, the author said that the corollary was 'not justified by the terms of the Monroe Doctrine, however much it may be justified by the application of the doctrine of self-preservation'; and point was given to this repudiation by the withdrawal of Amer. marines from Nicaragua and refusal to send them back when disorder threatened. But the U.S. Gov. declined to convert the doctrine into a multilateral pact among all the N. and S. Amer. states on the ground that such a change amounted to a treaty of alliance which was inconsistent with Amer. diplomatic traditions.¹ President Franklin Roosevelt withdrew the last detachment of marines from Haiti, abrogated the Platt Amendment which purported to legalise the right of intervention in that state—by mutual agreement with Cuba, and entered into a new treaty with Panama, relinquishing the right of intervention in that state. In his 'good neighbour' policy, Franklin Roosevelt's course of action was a radical departure from the 'big stick' policy of Theodore Roosevelt, and at the Buenos Aires Inter-Amer. Conference in 1936 a declaration was drawn up prescribing the principles which were thenceforth to govern the relations of all the states of the Amer. continents. These principles proscribed all territorial conquest, or intervention in each other's affairs, internal or external; and provided for the peaceful settlement of debt collection or of other disputes. At a conference in Lima in 1938 provision was made for inter-governmental consultation in the event of a threat to the peace of the Americas. All these developments represented a tremendous departure from the past, and in effect they meant that the U.S.A. had internationalised virtually every phase of the M. D. At the outbreak of the Second World War the gov. of Panama convened a meeting of all the foreign ministers in order to decide on a common neutrality policy, and at this conference the delegates agreed upon the famous 300-m. neutrality zone. In July 1940 the Havana Conference had to meet the first serious possibility in many years of a direct challenge to the M. D., namely the possibility that Fr. and Dutch colonial possessions in the W. might be occupied by or ceded to Germany. The conference approved the U.S.A.'s uncompromising attitude of the previous month, when the state dept. had

warned the belligerents that the U.S. Gov. would neither recognise nor acquiesce in any transfer of ter. in the Amer. hemisphere from one non-Amer. power to another. The conference also authorised the U.S. Gov. to intervene and to assume temporarily all administrative power over any European possessions in their hemisphere when a threat to the safety of the Amer. continents warranted such action. One indirect result of these developments has been to bring Canada into the orbit of inter-Amer. relationships much more closely than in the past, and in 1940 President Roosevelt took the decisive step of concluding a joint defence pact between the U.S.A. and Canada. See J. A. Casson, *The Evolution of the U.S.A. and History of the Monroe Doctrine*, 1904; W. P. Cresson, *The Holy Alliance: the European Backgrounds of the Monroe Doctrine*, 1922; and G. Kirk, *The Monroe Doctrine To-day*, 1941.

Monrovia, cap. of Liberia, W. Africa, at the mouth of the St. Paul R., on the Atlantic coast. It exports coffee, palm-oil, and palm-nuts, dye-woods, and rubber. It has a pop. of about 10,000, and is administered as a commonwealth dist. by a municipal board appointed by the president of Liberia. The gov. has a college, Liberia College, at M. A harbour development has been planned for M., and the port works have been constructed under lend-lease terms through the U.S. Gov. A wireless station is maintained there by the gov.

Mons (Flem. Bergen), cap. of the prov. of Hainaut, Belgium, 32 m. S.W. of Brussels. The city is situated between two important coal-mining dists., the Borinage to the W. and the Centre to the E. Its importance is mainly commercial. It has manufs. of cotton goods, paper, porcelain, oil, chocolate, soap, and tobacco. It is the most important coal market of Belgium. M. stands on the site of a Rom. camp, and has sev. interesting buildings, including the tn. hall (1443-67) and the collegiate church of St.-Waudru (1450-1621), with its belfry. There are also three museums. Pop. 25,600. See E. Hubbard, *Mons dans le passé et dans le présent*.

Mons, Battle of. At the outbreak of the First World War the small Brit. expeditionary force, under Gen. Sir John French (later Lord Ypres), was rushed across to France and took up a position to the left of the Fr. line about M., a small Belgian tn. near the Fr. border, about 32 m. S.W. of Brussels. On Aug. 22, 1914, the Gers. gained a victory over the Fr. at Namur, and threw them back, thus making a breach in the Entente line with the Brit. isolated on the left. The Gers. under von Kluck and von Bülow (total four corps) now attacked the two Brit. corps on Aug. 23. A frontal attack was launched. This proved an admirable target for the Brit. infantry, which poured in a sustained, well-aimed, rapid fire with rifles and machine guns. The Gers. fought well, but the accuracy and the rapidity of the Brit. fire took a heavy toll, and their attack was of no avail. Von Bülow now

made a flank attack on the right of the Brit., who had not been informed of the full details of the Fr. withdrawal. As soon as Sir J. French was informed of the vastly numerically superior forces to which he was opposed, he gave orders for a withdrawal in order to escape complete envelopment and annihilation. See also FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGNS IN.

Mons Capitulinus, see CAPITOL.

Monselice, com. of Italy, on the canal of M., 13 m. S.W. of Padua; has manuf. of textiles. Pop. 12,300.

Monserrat, or **Montserrat**, mt. mass in the prov. of and 23 m. N.W. of the city of Barcelona, Spain, on the r. b. of the

deflected to the S. and S.E. in the equatorial belt, and accompanied by violent typhoons in the neighbourhoods of the E. Indies and Madagascar. The M. is best known where contrast of air is very great—between air from the Sahara and the gulf of Guinea in W. Africa, between air from the Sudan and the Indian Ocean in E. Africa, as well as the classical Indian case. The term M. was originally brought to England from the E. Indies by Portuguese traders in Elizabethan times, but accounts of the winds were chronicled by Pliny and Aristotle, as well as by the Arab historian, Sidi Ali, in 1554. See Prof. Ferrel, *A Treatise on the Winds*, 1889. See also WIND.



MONSERRAT: THE BENEDICTINE MONASTERY

Llobregat. Its highest point is 4070 ft. At a height of 2910 ft. on the E. side is the Benedictine monastery, dating from the ninth century and containing a famous small, black, wooden image of the Virgin.

Monsignore, title of honour given to prelates in the Rom. Catholic Church, and to officers of the papal court.

Monsoon (from the Arabic *mawsim*, a season), term used generally for any wind which blows regularly at fixed seasons, but especially applied to those winds which blow over the Indian Ocean to India. From April till Oct. they blow from the S.W. (N.E. in Bengal), from Oct. to April they blow from the N.E. Their regularity is caused by the regular change of the seasons; during the winter the cold air from the interior of Asia flows outward in a general S.-westerly direction towards the warmer sea; when the land, on the contrary, becomes more heated than the sea, the direction of the current of air changes and flows inwards in a N.-easterly direction. The change to the S.W. M. is accompanied in parts of India by violent thunderstorms and torrential rains. It sometimes happens that the M. fails to bring the expected rains, and the result is such a famine as occurred in 1895 and again in 1899. The S.W. M. is

Mons Palatinus, see PALATINE HILL.

Monstrance (Lat. *monstrare*, to show), or **Ostensorium**, instrument used in the Rom. Catholic Church for holding the Sacred Host in benedictions, processions, and expositions of the Blessed Sacrament. It stands on a circular base, and the upper part is now almost invariably made circular with rays extending on all sides from the centre. The Host is itself held in a small crescent-shaped *tunula*, or *tunetle*.

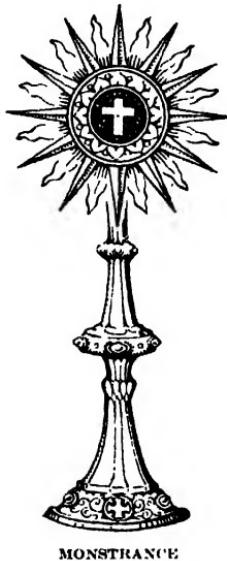
Monstrelet, **Enguerrand de** (1390-1453), Fr. chronicler, probably b. in Pont-l'Evêque. He was attached to the service of John of Luxembourg, and was at Compiegne when Joan of Arc was captured by the Burgundians. He was provost at Cambrai and a bailiff of Wallincourt (1444). His *Chronique*, covering the years 1400-41, continued Froissart's *Chronicle*, and is a clear and accurate account of current events. There is an Eng. trans. by Thomas Johns (1810), and the most recent Fr. ed. is that of Douet d'Arcé (1857-62).

Monstrosity, see DEFORMITY; TERATOLOGY.

Montacute, **Thomas de**, see SALISBURY, EARL OF.

Montacute House, 4 m. from Yeovil, a

magnificent building, was begun in 1580 by Thomas Phelps, and completed by about 1600 by his son, Sir Edward Phelps, Speaker of the House of Commons and master of the rolls under James I. It has curvilinear and finialled gables, open balustraded parapet, carved statues of the nine worthies standing in niches in the E. front, and fluted angle columns. The property, including St. Michael's Hill (the Mons Acutus) was presented to the public through the Society for the Protection of Ant. Buildings in 1931. A museum of fine period furniture, pictures, and tapestries is being formed in the house.



MONSTRANCE

Montagna, Bartolomeo (1450-1523), It. painter, b. at Orzinuovi, near Brescia. According to Vasari he was a pupil of Andrea Mantegna. He is regarded as the most eminent master of the school of Vicenza. His masterpiece is the altarpiece of San Michele at Vicenza (1499), later removed to Milan. His earliest known picture still extant is the 'Virgin and Child' (1487) at Bergamo. At Verona he painted the frescoes in the chapel of San Biagio.

Montagnana, walled tn. in the prov. of Padua, Italy, 22 m. S.W. of Padua. It has a fifteenth-century Gothic cathedral. Pop. 10,000.

Montagnards, or Montagne, name given to the extreme Democratic party in the first Fr. revolution. They were so called because they occupied the highest benches in the National Convention, while their opponents, the Girondists, sat on the floor of the house. The party included both Jacobins and Cordeliers, and its prin-

members were Danton, Marat, Robespierre, St. Just, and Collot d'Herbois, the men of the 'Reign of Terror.' See J. M. Thompson, *The French Revolution*, 1943.

Montagu, Charles and George, see HALIFAX, EARL OF.

Montagu, Edmund and John, see SANDWICH, EARL OF.

Montagu, Edward, see MANCHESTER, EARL OF.

Montagu, Edwin Samuel (1879-1921), Jewish-Brit. statesman, second son of first Baron Swallowing. He was educated at City of London School and Trinity College, Cambridge. Elected M.P. in 1906 he was unpaid private secretary to Asquith until his appointment as under-secretary for India in 1900. In 1914 he became financial secretary to the Treasury, and in 1915 privy councillor and chancellor of the duchy of Lancaster. On the formation of the coalition he became financial secretary to the Treasury once more, and from the summer of 1916 minister of munitions until the end of Asquith's premiership. Secretary of state for India in 1917 he collaborated in the M.-Chelmsford report, but in 1922 was obliged to resign for publishing a dispatch from the India Gov. without cabinet authority. Losing his seat in the 1922 election he went into the city.

Montagu, Elizabeth (née Robinson) (1720-1800), Eng. authoress and social leader, b. at York, married in 1742 Edward M., grandson of the first earl of Sandwich. She was one of the best-known and most popular of the 'blue-stocking' coteries, and entertained largely at Sandford, and at M. House, London. Among her writings was an *Essay on the Writings and Genius of Shakespeare* (1785), being a spirited reply to Voltaire. She was a voluminous correspondent and her *Letters* were collected and pub. (1809-13) by her nephew, Matthew M. There is a biography by Mrs. E. J. Climenson (1906).

Montagu, Lady Mary Wortley (1689-1722), Eng. authoress, b. at Thoresby in Nottinghamshire, was a daughter of Evelyn Pierrepont, first duke of Kingston. In 1712 she married Edward Wortley M., who four years later was sent as ambas. to the Porte. Lady Mary accompanied her husband to the E., and there learned something of the practice of inoculation for smallpox, which on her return in 1718 she introduced into this country. She lived in London for the next twenty years. Pope's quarrel with her is historic. Lady Mary circulated verses animadverting upon the obscurity of Pope's birth and declaring his physical deformity to be a divinely appointed emblem of his crooked mind. Pope, in beautifully cadenced couplets, declared that Lady Mary's lovers contracted a disreputable disease. Later he added such details as that her husband was a miser and the happy pair's board so frugal that a second half-pint of wine was reserved for some exceptionally blessed occasion - the rumour that their only son had been drowned. In his study of Lady Mary (1949) Lewis Gibbs paints a very different portrait of Mr. M.: no cuckold but a man of infinite patience,

forbearance, and common sense, willing to act as a foil and even as an anvil for his extravagant and unaccountable wife. The significance of their twenty years of separation is here examined with a realisation of the sadness underlying the life story of a brilliant and supremely self-confident woman. She went abroad in 1739, and remained away until the death of her husband in 1761, when she came again to England. Lady Mary's *Tours Eclogues* were first pub. in 1716 under the title of *Court Poems*. Her *Letters* were pub. in 1763, and her *Works* were collected in 1803. As she overestimated her power in verse satire so did she overestimate the merit of her indeed admirable letters, judging them, simply because they had so acrid a wit and so high a polish, equal to those of Madame de Sévigné. Much of her familiar writing suggests her age at its moral worst, and hence in the main that reputation for personal depravity about which Mr. Gibbs in the above work displays a wholesome and well-argued scepticism. See Violet Stuart Wortley, *Magic in the Distance*, 1948, and L. Gibbs, *The Admirable Lady Mary*, 1949.

Montague, Charles Edward (1867-1928), Eng. author. Educated at City of London School and Oxford Univ. His novels are of considerable merit, and among his other writings *Dramatic Values* (1911) contains excellent comments on the tendencies of nineteenth-century drama. Pub. works: *A Hind Let Loose* (1910); *Disenchantment* (1922); *The Morning's War* (1923); *Fiery Particles* (1923); *Rough Justice* (1926); and *Right off the Map* (1927). Some of these are based on his experiences in the First World War on active service. M. was a governor of the Manchester Univ. and a director of the *Manchester Guardian*. See O. Elton, *C. E. Montague*, 1929.

Montague, George (1751-1815), Eng. writer on natural hist., b. at Lackham, Wiltshire. He entered the army and served in the war with the Amer. colonies. He was one of the earliest members of the Linnean Society, for which he wrote papers on the birds and shells of S. England. He had a splendid collection of birds and other animals, which was purchased by the Brit. Museum. He pub. an *Ornithological Dictionary of British Birds* (1802) and *Testaceæ Britannica* (1803) on Brit. shells.

Montague, tn. in Franklin co., Massachusetts, U.S.A., 72 m. W.N.W. of Boston. Pop. 1100.

Montagues (Montecchi), see CAPULETS AND MONTAGUES.

Montaigne, Michel Eyquem, Seigneur de (1533-92). Fr. writer, b. at the château of St. Michel de M., near Bordeaux, in Périgord. His father, after serving in the army, became mayor of Bordeaux; his mother was Antoinette de Lopez (or Loupes), of a Jewish family, which had emigrated from Spain. Some of his nearest relations were Protestants, while he himself, three-fourths pagan though he was, lived and died in the Catholic faith; and this mixture of creeds in his blood is probably responsible for his wide spirit of

toleration. At the age of six he entered the Collège de Guelenne, Bordeaux, the head of which was the scholar, André de Goven, and where one of his 'familiar tutors' was George Buchanan, 'that famous Scottish poet,' and another was Marc-Antoine Muret. These masters wrote Lat. plays for the scholars, and M. tells us that he took part in them, but he does not hide the fact that he was lazy and read merely as his fancy prompted. From 1546 to 1554 his career is not certainly estab., but it is generally assumed that he was a law student at Bordeaux or Toulouse. At twenty-one he became a member of the Cour des Aides at Périgueux, and three years later a councillor of Parlement at Bordeaux. Etienne de la Boétie was his fellow member there, and M.'s account of his 'unspotted' friendship with him is one of the classics of friendship. At thirty-three he married Françoise de la Chassaigne, daughter of a councillor of the Bordeaux Parlement, whom apparently he had not married 'for love,' but who served him with loving care. In 1568, on the death of his father, he became head of the family. Life, however, in the law courts was very tedious for him, and in 1570 he resigned his post and retired to his château de M., where he lived with his books for the remainder of his life. He had already (1569) pub. his trans. of the *Theologia naturalis* of Raymond de Sébonde (a fifteenth-century prof. of Toulouse, and in the same year had also ed. the works of his deceased friend, La Boétie. In 1572 he began to write his essays, and pub. the first two books in 1580. In the latter year he travelled in Switzerland, S. Germany, Italy, and the Tyrol, and on his return was elected mayor of Bordeaux, and though at first he declined the dignity he gave way on receiving a letter from Henry III. commanding him to accept. Generally speaking, he seems to have fulfilled his duties with much tact, in spite of a somewhat hasty departure when the plague broke out with renewed vigour. The fifth ed. of his *Essais*, to which a third book was added, appeared in 1588. In that year he had gone to Paris to arrange for pub. and soon after became acquainted with Mlle de Gournay. He died of quinsy and was buried first at M., and later in the chapel of the Feuillants at Bordeaux. At his death he left to his wife and Mlle de Gournay the task of issuing a definitive ed. of his *Essais*, which appeared in 1595.

Few books have exercised a greater and more enduring influence on the literature and thought of the world than M.'s *Essais*, which were much read by Bacon and by Shakespeare, who made numerous borrowings from them. M. had great influence also upon Pascal, and upon Sainte-Beuve, who called him the wisest Frenchman who ever lived. M. appeals to readers of all classes; though upon the young and sanguine he has a depressing effect, for his criticism is analytic, sceptical, and inconclusive; there is a continual weighing of evidence, and nothing certain emerges save his uncertainty.

The titles of the essays frequently afford no indication whatever of their contents, and are but suggestions to prompt ideas. He talks in a disconnected way on innumerable topics, often completely losing sight of his original theme, yet always with a clear object in view. The essays seem unduly egoistic, but this was M.'s method of arriving at general rules of conduct. In the search after self-knowledge he lays bare his own moral and psychological outlook, caring as little for the exposure of his own weaknesses as for the revelation of those things upon which he prided himself. Hence we know M. more intimately than we know any other writer, not even excepting Pepys. The foundation and

morals, in the constant discussion of which he ranges himself on the side of antiquity as opposed to medievalism. In this connection his views on education are of great interest. M. recommends the learning of foreign languages, but deprecates the wasting of so much time on Lat. and Gk., and, further, he thinks that the master should not confine himself to books. Corporal punishment is mercilessly attacked. But the defects of M.'s system of education are that it gives no scope to individual effort, and that athletics are neglected, while, generally, his theories lead to the development of social and worldly qualities. The chief Eng. trans. are by John Florio, 1603; C. Cotton (revised by W. Hazlitt), 1845 (new ed., 1923); G. B. Ives, 1926; and trans. of the *Journals* by W. Waters (1903-4) and E. Trechmann, 1929; latest ed. by J. J. M. Stewart, 1931. See A. Grun, *Vie publique de Michel Montaigne*, 1855; R. W. Emerson, *Representative Men*, 1882; J. Fels, *Shakespeare and Montaigne*, 1884; M. E. Lowndes, *Michel de Montaigne*, 1898; E. Dowden, *Montaigne*, 1905; Edith Siebel, *Michel de Montaigne*, 1911; J. Plattard, *Montaigne et son temps*, 1933; C. Dédéyan, *Montaigne chez ses amis anglo-saxons*, 1947; and A. Gide, *Montaigne*, 1948. See also *Cürres*, ed. by Arnaingaud, 1626, and ed. by Plattard, 1931.

Montalban, tn. of Carabobo, Venezuela, 28 m. W.S.W. of Valencia. Pop. 8500.

Montalembert, Charles Forbes de Tryon Comte de (1810-70), Fr. historian, b. in London, the son of a Fr. émigré and his Eng. wife. In 1830 he joined Lamennais on the staff of the *Irenir*, accompanying him to Rome and to Munich. He submitted to the pope in 1835 his *Histoire de Ste Elisabeth d'Hongrie*, and pub. it in 1836, the first-fruits of his medieval studies, which was followed by *Durandalisme et du catholicisme* in 1839. Failing as a moderate opponent of the empire to secure re-election to the Legislative Assembly in 1857, he devoted himself entirely to literature. He was elected to the Academy in 1852. His great work was *Les Moines d'occident depuis St. Benoît jusqu'à St. Bernard* (1860-77, Eng. trans., 1861-79). He also pub. *L'Irenir politique d'Angleterre* (1856); *Mémoire de l'Abbé Lavoüaire* (1863); and *Le Pape et la Polylie* (1864). See lives by Mrs. Olliphant, 1872; E. de Meaux, 1897; Père Leucannet, 1895-1901; and P. de Lallier, 1927.

Montalvan, Juan Pérez de, see PÉREZ.

Montana, N.W. state of the U.S.A., bounded on the N. by Canada, E. by N. and S. Dakota, and S. by Wyoming and Idaho, the latter also bounding it on the W. It is the third in size of the Amer. states, with a total area of 147,100 sq. m. There are Indian settlements, with a total Indian pop. of 16,800. The E. part consists of rolling plains rising from an elevation of 3000 to 4000 ft. at the base of the Rocky Mts. in the W., where Mt. Douglas (11,300 ft.) is the highest peak. In the N. is Glacier National Park. The Missouri rises in Yellowstone



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essence of his ideas are contained in the ironical *Apologie de Raymond Sébonde*, being an eloquent diatribe against the value of human reason so far as metaphysics and science are concerned. M. had no sympathy with innovation. He was born in a disillusioned age, when the splendid dawn of the Renaissance had faded into the light of common day. Thus the scepticism of age succeeded the enthusiasm of youth, and M. was its typical representative and indeed he takes himself as a representative of 'la moyenne humilité.' Nature, while remaining our guide, must be submitted to discipline; for the human mind is a 'dangerous vagabond,' in whose footsteps misfortune is sure to follow if it is not held in check and prevented from forming personal opinions dangerous to tradition. With M. indeed begins the reaction of the seventeenth century as represented by the *opinions générales*, i.e. by authority, and for the same reason, and because he hated all innovations, he condemned the reformation as an arrogant revolution. All his attention is given to points of practical

Park to the S. of the state line; the Yellowstone, Madison, Bitterroot, Milk, Sun, Marias, Teton, and others drain the greater part of the state, while the Missoula and Kootenay drain the N.W. corner. In the riv. valleys and where irrigation has been extensively introduced the soil is very productive, and wheat and other cereals, flax-seed, potatoes, hay, sugar-beet, and fruit are grown. Sheep, cattle, and horses are reared in large numbers, and there are wide areas of forest. Of the immense potential water power, only about a third has been developed. The great industry of the state is mining, the total value of the mineral products amounting in 1948 to \$75,816,000. Coal, copper, manganese, zinc, petroleum, gold, silver, and sapphires



A MONTANA INDIAN

are found. Other industries include smelting and flour-milling. The cap. is Helena (15,000), Butte (37,000) and Great Falls (30,000) are the largest tns. Other tns.: Billings (23,000); Missoula (19,000); Anaconda (11,000). M. was organised as a ter. in 1864, and admitted to the Union in 1889. It has a senate of fifty-six members, and a house of representatives of ninety; it sends two senators and two representatives to Congress. Pop. (1940) 550,000 (increase of 4 per cent over that of 1930). See *Montana*, issued by the Dept. of Agriculture, Labour, and Industry; *Montana's Production, 1930-46*, by the Bureau of Business Research, Montana State Univ.; and J. K. Howard, *Montana: High, Wide, and Handsome, 1943*.

Montanism, heretical movement of the second century. Montanus, its leader, was a native of Mysia, and the movement took its rise at a tn. of Phrygia. Montanus conceived that he had a mission to bring the Church back to a state of strictness and purity, but his great claim was to be the Paraclete promised by Jesus to his disciples. He taught that revelations

to man still continued, and these were frequently delivered by himself and by his female companions, Prisca and Maximilla. He proclaimed that the end of the world was at hand, and that then Christ would reappear at the tn. of Pepuza in Syria. M. was strict and most ascetic. No forgiveness was possible after mortal sin; the sacraments were therefore unnecessary; marriage was discouraged as an inferior state. At first the sect spread rapidly and made its most famous convert in Africa, where Tertullian joined its ranks. It was condemned unhesitatingly in sev. local councils, and finally in the Council of Constantinople (381). It died out in the W. about the fourth century, and did not survive much longer in the E. Ritschl's investigations supersede the older works of Tillmont, Wernsdorf, and others, and were pub. in 1811 with the title *Der Montanismus und die christliche Kirche des 2ten Jahrhunderts*. The later works, of which the best known and most exhaustive is G. Bonwetsch's *Geschichte des Montanismus* (1881), all follow the lines laid down by A. Ritschl. See also C. Adam, *Kirchenbegriff Tertullians*, 1907; A. Holland, *Deux herétiques*, 1935; and works on Christian dogma.

Montargis, tn. in the dept. of Loiret, France, at the junction of three canals connecting the Seine and the Loire, 40 m. E.N.E. of Orleans. It is a railway junction and an important trade centre. A bronze monument commemorates the combat between M.'s dog and Macaire, the murderer of M., in 1371. Pop. 12,000.

Montauban, see COUSIN-MONTAUBAN.

Montauban, cap. of the dept. of Tarn-et-Garonne, France, overlooking the Tarn R., 31 m. N. of Toulouse. It has a Renaissance cathedral completed in 1739. It has manufs. of cloth, woollens, sugar, and metal-ware, and a large trade in horses, grain, oil, wine, and leather. The tn. was founded by Count Alphonse of Toulouse in 1141, and was an episcopal see from 1317 to 1560. It became a Huguenot stronghold and was constantly besieged. At the fall of La Rochelle M. submitted, but its fortifications were destroyed in 1629. Pop. 28,700.

Montbéliard, tn. in the dept. of Doubs, France, at the confluence of the Allaine and the Lisonne, 48 m. E.N.E. of Besançon. The castle dates from the fifteenth century. There is a statue to Cuvier, the naturalist, b. here in 1769. The chief manufs. are watches and textiles. Pop. 10,500.

Mont Blanc, see BLANC, MONT.

Montbretia, genus of S. African plants (order Iridaceae), now incorporated in the genus *Tritonia*. The flowers are of great variety of yellow and red tints, and are borne on long graceful spikes. April is the best month for planting. M. may also be grown in pots, in a mixture of sandy loam and leaf-mould.

Montbrison, tn. in the dept. of Loire, France, 20 m. N.W. of St. Etienne. It has mineral springs. Pop. 1800.

Montcalm, Louis Joseph, Marquis de (1712-59), Fr. soldier, b. at Candiac, near Nîmes. In 1727 he entered the army, be-

coming a captain at the age of eighteen. He served in Italy and Germany, being wounded at Piacenza (1746). In 1756 he was placed in command of the Fr. troops in Canada, captured Fort Ontario and Fort William Henry from the Eng. (1757), and repulsed Gen. Abercrombie's attack at Ticonderoga (1758). Lack of reinforcements and provisions forced him to retire to Quebec, where he was besieged in 1759 by Wolfe, both falling mortally wounded in the battle on the Heights of Abraham. In 1827 a monument to the joint honour of Wolfe and M. was erected in Quebec. See F. Parkman, *Montcalm and Wolfe*, 1884; Falgoutrolle, *Montcalm devant la postérité*, 1886; and H. R. Casgrain, *Wolfe and Montcalm*, 1906.

Montceau-les-Mines, tn. in the dept. of Saône-et-Loire, France, on the Canal du Centre, 25 m. W.S.W. of Châlon-sur-Saône. It is the centre of a coal-mining dist., and has iron foundries and machine shops. Pop. 26,800.

Mont Cenis, see CENIS, MONT.

Montclair, tn. of Essex co., New Jersey, U.S.A., 5 m. N.N.W. of Newark, is a favourite residential quarter. Pop. 39,800.

Mont de l'Enclus, see KLUISBERG.

Mont-de-Marsan, tn. of France, cap. of the dept. of Landes, at the junction of the Midon and Douze, 61 m. S. of Bordeaux. Pop. 14,000; elev. 124,000.

Mont-de-Piété (It. *Monte di Pietà*), estab., where money is lent to the poor at a moderate rate of interest, was founded, to combat the evils of usury, about the middle of the fifteenth century at Orvieto (1463) and Perugia (1467). The first estab. in Paris was opened in 1777, suppressed during the revolution, but later restored as a national undertaking with the right to charge 9 per cent on all loans to pay working expenses; any surplus gain goes to public charities. While the estab. at Paris is the largest in the world there are also similar centres of municipal pawn-broking in many European countries. In England the system appeared for a time during the eighteenth century, being abandoned as a non-practical idea after some seventy years. See also PAWN-BROKER.

Montdidier, tn. in the dept. of Somme, France, on the R. Somme, 21 m. S.E. of Amiens. It suffered damage in the Second World War. Pop. 4300.

Montebello, vil. in the prov. of, and 10 m. S.W. of the city of, Vicenza, Italy. The Austrians were defeated here in 1796 by Gen. Bonaparte, and in 1805 by the Its. under Prince Eugène de Beauharnais. Pop. 5400.

Montebello Casteggio, vil. in the prov. of, and 14 m. S.S.W. of the city of, Pavia, Lombardy, Italy. The scene of two decisive feats of the Austrians by the Fr. in 1800 under Gen. Lannes, and in 1859 by the Fr. and Piedmontese. Pop. 3000.

Montebelluna, com. in the prov. of, and 13 m. N.W. of the city of, Treviso, Italy. Pop. 10,000.

Monte Carlo, tu. in the principality of Monaco, and 9 m. E. of Nice, overlooking the Mediterranean Sea. It is a popular winter and sea-bathing resort, but is

chiefly known for its gaming estab. The concessionnaire (a joint-stock company) pays an ann. grant of £50,000, rising in 1937 to £100,000. The first gaming estab. was opened by two Frenchmen named Langlois and Albert, and there were other adventurers before François Blanc came on the scene, but none of them flourished. M. Blanc, however, having through the secretary of the gov. of Monaco purchased the Casino and the right to gamble for a sum approaching £70,000, organised the Casino into a commercial success. A railway was opened in 1868, a good steam-boat service instituted, and better hotel accommodation provided. In 1881, after the death of Blanc, the cap. of his company (the Cercle des Etrangers) was doubled from 15,000,000 francs to 30,000,000, divided into 60,000 shares of 500 francs each. Pop. c. 10,600. See MONACO.

Monte Cassino Monastery, see CASSINO.

Montecatini, two watering-places in Italy: (1) In the prov. of Pisa, 7 m. W.S.W. of Volterra; has copper mines. Pop. (com.) 5600. (2) In the prov. of Lucca, 30 m. W.N.W. of Florence. Pop. 9000.

Montecchi, see CAPULETS AND MONTAGUE.

Monte Cinto (8890 ft.), highest point in Corsica (q.v.).

Monte Cristo, small rocky islet off the W. coast of Italy, 28 m. S. of Elba. It is 2110 ft. in height, and has been a penal settlement since 1874. See A. Dumas, *The Count of Monte Cristo*, 1850.

Montecuculi, Raimondo, Count (1609-1680), Austrian general, b. at Modena. In 1625 he entered the Austrian Army as a volunteer, serving through the Thirty Years war. In 1657 he fought against the Swedes, and in 1660-64 against the Turks who had invaded Transylvania. In 1672, when Austria supported Holland against France, M. was in command of the imperial army and opposed Turenne in the campaign on the banks of the Rhine (1672-73). The Emperor Leopold made him a prince of the empire, and he was made duke of Melti. See his *Mémoires* (1703).

Montefiascone, tn. in the prov. of Rome, Italy, 9 m. N.W. of Viterbo. It occupies the site of the Etruscan Fanum Voltumne, and is famous for its muscatel wine. Pop. 11,900.

Montefiore, Sir Moses Hayim (1784-1885), Jewish philanthropist, b. at Leghorn, Italy. He became a member of the London Stock Exchange, and made a large fortune. In 1818 he became president of the Sp. and Portuguese community, and made strenuous endeavours to remove the civil disabilities of the Jews in England. He was high sheriff of Kent, and in 1837 was admitted a sheriff of London. See I. Loewe (ed.), *Diaries of Sir Moses and Lady Montefiore*, 1890.

Montegnée, tn. in Belgium, 3 m. W. of the city of Liège. It has coal-mines. Pop. 10,600.

Montego Bay, tn. on the N. coast of Jamaica, and the second tn. of the is., 113 m. from Kingston, by rail. It is

attractive and historically interesting. It was a large Indian vil. when Columbus visited it (1494). There are traces of Arawak life in the sea caves. Lard was an export in the time of the Sp. occupation—whence its name, from *mantecca* (hog's butter). St. James's Church was built 1775–82. In the bay is a cluster of coral atolls, known as the Bogue Islets. Pop. 8600.

Montégut, Jean Baptiste Joseph Émile (1825–95), Fr. critic and author, *b.* at Limoges. In 1857 he was made editor of the *Révue des deux mondes*. In 1862 he joined the *Moniteur universel*. He wrote *L'Angleterre et ses colonies Australies* (1879); *Essais sur la littérature anglaise* (1883); *Écrivains modernes de l'Angleterre* (1885–1892), and trans. the works of Shakespeare (1892), Macaulay, and Emerson.

Monteith, see MENTETH.

Monteleone, tn. in the prov. of, and 26 m. S.W. of the tn. of, Cantanzaro, Calabria, Italy. The tn. was wrecked by an earthquake in 1905. Pop. 10,100.

Montélimar (Rom. *Aescium*), tn. in the dept. of Drôme, France. 27 m. S.S.W. of Valence. It has manufs. of silk, cotton, bricks, and tiles. Pop. 13,800.

Montelius, Gustaf Oscar Augustin (1843–1921), Swedish archeologist, *b.* at Stockholm. He was connected with the Hist. Museum at Stockholm in 1863, and in 1888 became a prof. and director there. Some of his books are *The Civilisation of Sweden in Heathen Times* (1888, Eng. trans.); *Ancient Dwellings in Europe* (1895); *The Prehistoric Age in Sweden* (1895); *Primitive Civilisation in Italy* (1895–1910); *The Bronze Age in Egypt* (Eng. trans.); *The Bronze Age in North Germany and Scandinavia* (1900); and *The Bronze Age in Sweden* (1900).

Montemayor, Jorge de (1520–61), Sp. poet, *b.* at Montemor-o-Velho, near Coimbra, Portugal. His fame rests on his unfinished pastoral romance, *Diana enamorada* (1558; Eng. trans. 1598, by Bartholomew Young). An ed. of his works appeared in 1886. See H. Rennert, *The Spanish Pastor*, 1912; also life by G. Schonherr, 1886.

Montenegro (Black Mt.), called by the natives *Tzernagora* and by the Turks Karadagh, all three names expressive of the peculiar features of the country, is a small country, now a federative unit of Yugoslavia, situated between Herzegovina and Albania, and separated from the Adriatic by the narrow strip of land known as the circle of Cattaro, in Dalmatia. It contains about 3630 sq. m., and is everywhere mountainous, the intervening in most cases clothed with dark forests of fir, ash, beech, oak, ilex, willow, and poplar. Mt. Dormitor, in the N., is 9146 ft., and Kutsh Kom, in the E., 9300 ft. above sea level. Agriculture is prosecuted to the utmost extent the country will admit of, but in a primitive manner, which the govt. is now attempting to modernise. There are vineyards, tobacco is cultivated, and the mulberry for silkworms. The Sumach (*q.v.*), one of the most valuable of the natural trees, is not uncommon. Few oxen are reared, but

sheep, goats, and swine abound. The new cap. is Titograd (formerly Podgorica). The Montenegrins or Tzernagorzies are Slavs of the Serbian race, and number about 360,000. They are knit together in clans and families and have many feuds amongst themselves. Their chief occupations at home are agriculture and fishing. Their language is a very pure dialect of the Slavic. They belong to the Orthodox Gk. Church.

History.—M. belonged in the Middle Ages to the great Serbian kingdom, but after the battle of Kossovo (1389) the Montenegrins maintained their independence, though compelled to relinquish the level tracts about Scutari, with their chief fortress of Zabljak, and confine themselves to their mts. (1485). In 1516 their last secular prince resigned his office and transferred the gov. to the *vladika*. The country was conquered by the Turks again in 1714, but on their withdrawal it resumed its independence. In 1796 the prince-bishop, Pietro I., defeated the pasha of Scutari, who had invaded M. In 1851 the last prince-bishop died, and his successor, Danilo I., separated the religious from the secular supremacy, retaining the latter under the title of Gospodar. The Turks, under Omer Pasha, again invaded the country; but the intervention of the great powers compelled a treaty, Feb. 15, 1853. Until 1918 the country was a constitutional monarchy with Nicholas I. as king. In 1912, in concert with Serbia, Bulgaria, and Greece, M. declared war on Turkey, their operations being principally conducted in N.W. Albania. In 1913 the Montenegrins captured Scutari, but were compelled by the European powers to abandon it. In Jan. 1916 the Austrians took Mt. Lovćen (*q.v.*), the key of the kingdom, and entered Cetinje. King Nicholas fled from the country to Italy, leaving his second son with the Austrians. One of his sons, supported by the Royalist party, declared himself king, but abdicated after a short period. The 'pact of Corfu' included M. in the Serbo-Croat-Slovene state, which in 1929 became Yugoslavia. See also BALKAN WAR; TURKEY; YUGOSLAVIA. See F. Stevenson, *A History of Montenegro*, 1913; P. Edmonds, *To the Land of the Eagle*, 1927; and A. Steinitzer, *Dalmatien*, 1930.

Monenotte: 1. Vil. in the prov. and 26 m. W. of the city of Genoa, Italy, was the scene of Napoleon's first victory over the Austrians in 1796. Pop. 3,500. 2. Tn. in the prov. of, and 109 m. W.S.W. of the tn. of Algiers, N. Africa; iron, lead, copper, and silver are found in the neighbourhood. Pop. 4000.

Montepeloso, see INSIENA.

Montepulciano, tn. in the prov. and 28 m. S.E. of the city of Siena, Italy, at an altitude of 2070 ft. It is famous for its wines. Pop. (com.) 17,500.

Montereau, tn. in the dept. of Seine-et-Marne, France, at the confluence of the Seine and the Yonne, 12 m. S.E. of Fontainebleau; it has manufs. of porcelain, pottery, bricks, and cement. Pop. 10,000.

Monterey, city of California, U.S.A., on

M. Bay, 90 m. S.S.E. of San Francisco. It is a favourite winter resort of the Pacific coast. There is good fishing, especially for salmon, and the city has sardine canneries and large oil tanks, about 60,000 tons of oil being shipped annually. Stock-raising is also a prominent industry, and sand-lime brick is manufactured. Pop. 10,000.

Monte Rosa, see Rosa, MONTE.

Monterrey, city of México, cap. of the state of Nuevo Leon, on the San Juan, at the head of a large and beautiful valley. Formerly merely a pass city, offering an easier route through the Sierra Madre than elsewhere, it is to-day one of Mexico's leading industrial centres. In 1880 it had no more than 30,000 inhab.; its first period of rapid growth came with the construction in 1888 of the railroad from the Texas border at Laredo to M., built with the objective of using the pass to Saltillo as the route to the highlands and to Mexico city. In recent years M.'s further rapid growth has been the result of the construction of the Pan-Amer. highway from Laredo through M. Inland from Tampico this highway passes through country formerly inhabited only by scattered tribes of Indians, who lived on wild game from the forests. To-day a large tourist industry has developed from America with air-conditioned hotels and tourist camps on the route, and M., now so easily accessible to the N. Amer. public, is being transformed in the process. Social anthropologists look upon this southward penetration of N. Amer. culture traits as a social phenomenon worthy of careful study. In M. about three-quarters of the iron and steel of Mexico is produced, the iron ore coming from the Durango deposits. Production is about 150,000 tons annually. There are also woollen mills, brass foundries, saw mills, flour mills, breweries, and a carriage and wagon factory. M. is the see of the bishop of Linares, and has a large cathedral and an episcopal palace. The tn. was founded in 1560, and chartered as a city in 1596. In 1846 it was besieged and taken by Gen. Taylor at the head of the Amer. forces. In 1909 about one-fourth of the city was swept away by a flood. Pop. 125,000.

Monte Sant Angelo, tn. in the prov. and 27 m. N.E. of the city of Foggia, Italy. The church of St. Michael is much visited by pilgrims. Pop. 23,000.

Montespan, Françoise Athénals de Rochechouart, Marquise de (1641-1707), favourite of Louis XIV., b. at Tonny-Charante, was the daughter of the duc de Mortemart. In 1663 she married Louis, marquis of M. Having become maid of honour to the queen, in 1668 she attracted the notice of Louis XIV., who made her his mistress. She was both beautiful and witty, and remained for many years the favourite of the king, to whom she bore seven children. She was, however, supplanted by Mme de Maintenon in 1691, and left Versailles and retired from the world in 1700, after which she resorted to magic. Her *Mémoires* (1829) have been trans. into Eng. (1895). See F. Funck-Brentano, *Le*

Drame des poisons, 1900; V. Sardou, *L'Affaire des poisons* (dramas); and studies by H. Williams, 1903, and H. Carré, 1939.

Montesquieu, Charles de Secondat, Baron de la Brède (1689-1755), Fr. philosophical historian, b. in the château of La Brède, near Bordeaux. In 1714 he was appointed councillor of the Parlement of Bordeaux, and two years later on the death of his uncle, Jean Baptiste de Secondat, he succeeded to his title and fortune as well as to his judicial office as president of the Parlement of Bordeaux. His early studies were directed to natural science, and in 1721 he pub. *Discours sur les causes de la transparence des corps* and *Observations sur l'histoire naturelle*, but there was nothing especially noteworthy in this side of his work. But in the same



MONTESQUIEU

year appeared his *Lettres persanes*, a subtle satire on contemporary Fr. institutions and manners, written in the guise of a correspondence between two Persian noblemen travelling through Europe. This book achieved an immediate and resounding success, and indeed definitely encouraged him to continue a literary career. In the wide social and political satire and reflections on government and jurisprudence in this work we can already see the beginnings of *L'Esprit des lois*. In 1728 he pub. anonymously a poem (though like Buffon he looked upon prose as the ideal vehicle of thought), entitled *Le Temple de Gnide*, and was admitted to the academy three years later. After travelling for three years in foreign countries in order to gain the knowledge of the constitutions and conditions of the prin. civilised countries, which would be necessary for the ambitious work on jurisprudence which he already contemplated, he wrote *Considérations sur les causes de la grandeur des Romains et de leur décadence* (1734), a most able study of ancet. Rome. For the conception of this work M. was indebted to J. Bossuet's *Discours sur*

L'histoire universelle (1844), in the course of which are enumerated the causes of the greatness of ancient Rome, love of liberty and fatherland, loyalty to leaders and the state, and so forth, and the causes of her decadence, particularly distant wars, an over-expanded empire and the corruption that ensues on ease and luxury. The work is important, not so much for its ingenious theories or explanations as for the wide and philosophic view of history, the broad generalisations, which reflect the originality and significance of M.'s method. In 1748 appeared *L'Esprit des lois* in thirty-one books. This work, which took twenty years in compilation, and is one of the most important works of the eighteenth century judged from its influence on jurisprudence, is in effect the sum of M.'s observations and reflections, with the deductions he had drawn from the social and political phenomena of many states. It is to be observed that M. here uses the word *loi* not in the narrow technical sense, save in the last six books, which are purely legal hist., but as connoting 'the necessary relations existing between different things resulting from the nature of the things themselves.' The work is stupendous in range, but lacking in uniformity of plan, and in fact M. had no definite design for the whole, but included in the thirty-one books all the thoughts, deductions, and reflections accumulated over many years without regard for systematic arrangement or even logical sequence. M.'s admiration for the free Eng. constitution, which is to be inferred from book xi. of his work, had much influence on the earlier course of the Fr. Revolution, as well as having its effect on his discussion of the various types of gov. and of liberty in relation to govt. The standard ed. of his works is that of E. Laboulaye (7 vols.), 1875-79. See lives by L. Vian, 1879; A. Sorel, 1887; Sir C. P. Elbert, 1904; J. Dedieu, 1913; and G. Lanson, 1932. See also A. Charraux, *L'Esprit de Montesquieu*, 1885; E. Faguet, *La Politique comparée de Montesquieu, Rousseau et Voltaire*, 1902; C. Ouden, *Le Spinicisme de Montesquieu*, 1911; B. Kingsley Martin, *French Liberal Thought in the Eighteenth Century*, 1929; and N. Duconseil, *Marihiare et Montesquieu*, 1943.

Montesquieu, Comte Robert de (1855-1921), Fr. writer and one of the most discussed figures in modern Fr. literature, b. in Paris. M. was proud of his family, which he claimed went back to the Merovingian kings; and it was certainly true that his genealogy included many great Fr. soldiers and statesmen, including the immortal d'Artagnan, who served as model for the famous character by Dumas. Although M. wrote many books of criticism, he devoted himself mainly to poetry, full of artifices and pretiosities. The very titles proclaim this: *Les Chauves-Souris* (1893); *Les Hortensias bleus* (1896); *Perles rouges* (1899); and *Les Paons* (1900). He will probably be celebrated in after times because J. K. Huysmans took him as a model for his sinister character of des Esseintes in *A Rebours*, and Marcel Proust is also supposed to have used him

In part as the model for one of the figures in his famous novel, *Recherche du temps perdu*.

Montessori, Maria (b. 1870), It. educationist and doctor, b. at Ancona, she was the first woman to qualify as a medical doctor at the univ. of Rome, where, in 1904, she became a prof., teaching anthropology. She held the chair of hygiene for eleven years at the Magistris Femminile of Rome, and in 1913 was made a member of the Academy of Science in Chicago. Dr. M., a leading feminist, has spoken against child labour and the exploitation of children's work.

Dr. M. took special interest in nervous diseases of children, making a study of



Montessori Centre

MARIA MONTESSORI

them at the Bicêtre and the Salpêtrière, in Paris. She was one of the first to take up experimental psychology, at the end of the nineteenth century, and attributes her real preparation to the writings of two Fr. doctors, Itard and Séguin. Dr. M. considered these the first two genuine contributions to scientific pedagogy. She became directress of the Scuola Ottofrenica (mind-straightening school) at Rome, for feeble-minded children and achieved such startling results that the so-called 'idiots' were able to compete with normal children of their own age. She then began to suspect that if her scientific method was applied to normal children it would bring about a radical reform of education. Her first experiment in this direction took place in 1906. It was attended with such success that she gave up her medical practice and her two chairs at the univ., and directed her future field of research to the education of normal children. Her 'children's houses,' built in proportion to the size of the children themselves, and designed to correspond to their psychological needs, appeared in

all parts of the world. The M. system (*see under EDUCATION*) rapidly became world famous, and a series of international courses for training M. directresses began in Rome in 1913 and 1914, were transferred to the U.S.A. and Spain during the First World War, and have continued ever since, either yearly or biennially, in different countries of Europe, particularly in Holland. Thirteen of these were held in London in the inter-war years, and another in 1946. During the Second World War Dr. M. resided in India, holding courses in Madras, Karachi, Ceylon, and Poona. Her teachings there have found special favour among all castes, the students working harmoniously together. Her pubs. include *The Method of Scientific Pedagogy as applied to Infant Education in the Children's Houses* (trans. into fourteen languages), which appeared in Eng. entitled *The Montessori Method* (1912); *Pedagogical Anthropology* (1913); *The Advanced Montessori Method*, vols. I. and II. (1918); *The Secret of Childhood* (1936); *Education for a New World* (1946, 1948); and *To Educate the Human Potential* (1948). Permanent institutions for the training of M. teachers, either directly or indirectly, associated with Dr. M.: The M. Training College, Cranleigh, Surrey; The Child Education Foundation, 533 E. 84th Street, New York; Arundale M. Centre, Adyar, Madras, The Municipality of Amsterdam; The M. Centre, 68 St. Mark's Road, London, W.10. There are M. societies in London (68 St. Mark's Road); in Edinburgh (63 Merchiston Crescent); in Holland (Amsterdam, Olypinplaatje 59); in Italy (Via Nicotera 29, Rome); and in France (22 Rue Eugene Flachat, Paris). See *Mario M. Montessori, Dr. Montessori and her Work*, c. 1935.

Monteverdi, or Monteverde, Claudio (1567-1643), It. composer, b. in Cremona, and studied under Ingognetti, the duke of Mantua's *maestro di cappella*, whom he succeeded in that post in 1603. His name is of great importance in the hist. of music and, especially, of opera. He is considered by many historians to be the originator of the orchestra, and of what was at that time called the 'new music.' Others regard him as being rather the last and chief exponent of the old tradition than the first of the new, because in his opera *Orfeo* (composed 1608) the prin. part is played not by strings or wind, but by plucked instruments (lutes and the like), destined, excepting the harp, to disappear from the orchestra. Whichever view be taken M. remains musical genius and an original composer. In his madrigals, church music, and opera he laid the foundation of modern music by breaking away from the old polyphony by his freer use of extended melody. He was the first composer to use unprepared discords or dissonances, as in his madrigals, the beauty of which they marred, but he afterwards used them in music of a very different kind, as exemplified in his first opera *Ariana*, produced in 1607, with entire success. His second opera, *Orfeo*, was even more successful, and it remains an important opera also from its being

based on the principle that the only law to which the dramatic composer need conform is that of suiting the music to the demands of the scene. M. was invited to Venice in 1613 as *maestro di cappella* of St. Mark's, and here he remained for thirty years. At Venice he wrote much sacred music, most of which is lost (there are extant some Vespers and Masses). In 1630 appeared another grand opera, *Prosperina rapita*; *L'Adone* was produced in 1639; in 1641 *Il Ritorno d'Ulisse in Le Nozze di Enea*; and in 1642 *Poppea* (or *The Coronation of Poppea*). Though some of these were composed in old age, they show no decline, and in the *Ulisses* are passages in which may be traced the germ of comic opera. M. was ordained priest in 1633, but this seems to have in no way affected his musical activities. See lives by H. Prunières (Eng. trans.), 1926, and G. F. Malipiero, 1930; also H. F. Redlich, *Das Problem des Stilwandels in Monteverdis Madrigalwerk*, 1931, and 'Monteverdi's Religious Music' in *Music and Letters*, 1946.

Monte Vergine (Italy), see AVELLINO.

Montevideo, or Banda Oriental: 1. Cap. of the republic of Uruguay, in S. America, is situated on the N. shore of the estuary of the Rio de la Plata (which is here 60 m. wide), and 132 m. E. by S. from Buenos Aires. It is one of the great cities of the continent. It stands on a small peninsula, and is surrounded by a wall and fortifications. The houses are mostly of one storey, with flat roofs, which are often used as gardens. The public buildings worthy of notice are the cathedral, the univ., and the tn. hall. M. has large Sp. and It. colonies, and a small Brit. community. There is also a Brit. hospital and a King Edward VII. sanatorium. The climate is healthy and the tn. clean and prosperous looking; but, as there are no rives. near the tn., water is scarce, and it is only obtainable from wells, or by collecting rain-water in cisterns. There are sev. plazas or open spaces, and a public park. The bay or harbour, which is about 3½ m. long by 2 m. broad, presents excellent facilities for building wharfs, docks, etc., is sheltered from all but the S.W. gales, and averages 16 or 17 ft. in depth. The trade of M. is extensive, the exports consisting of live-stock, the main wealth of the republic. Cattle are sent to the Argentine, and frozen meat to other parts of the world. Wool, hides, horns, wheat, flour, corn, hay, barley, tobacco, fruit, hair, tallow, salt, and preserved beef, bones, etc., are also exported. The chief trade is with Great Britain. M. is the anchorage during the winter months of various whaling flotillas, particularly of those S. Atlantic whaling fleets which belong to Scandinavia and Great Britain. It is also a resort city of considerable popularity, largely patronised by Argentines, and easily reached from Buenos Aires by an overnight boat trip or by aeroplane. The hotels and casinos of M. are famous, and being owned by the state they bring in a good income to the Uruguayan treasury. M. has direct communication by steamship with all the prin.

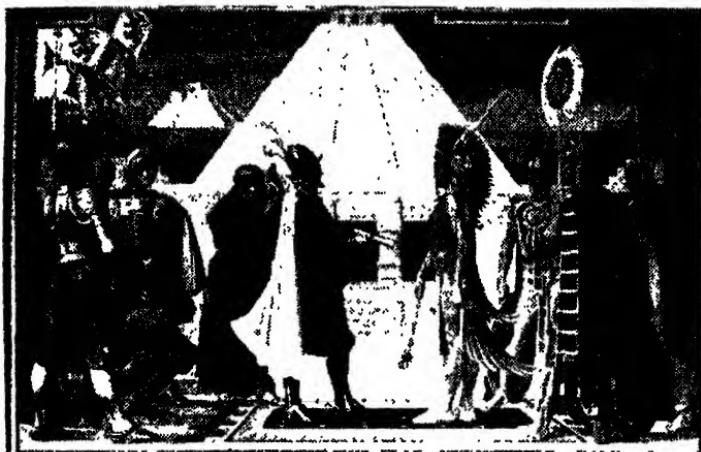
ports of the world. All Uruguayan railways, which are mostly in the hands of Brit. companies, converge on M. There is a wireless station at Cerrits, near M. The city was founded by the Spaniards in 1726; it became free in 1814, and in 1828 was made the cap. of the republic. Pop. 770,000. 2. Dept. of Uruguay, comprising the small area around the city of M. The greater part of the country's wine, of which 60,000,000 litres per annum are produced, comes from this dept. Area 256 sq. m. Pop. 541,042.

Monte Viso, see VISO, MONTE.

Montezuma I. (c. 1390-1464), emperor of anc^t. Mexico, succeeding his brother in

made a journey to Italy for the purpose of consulting the MSS. in the It. libraries. In this pursuit he passed three years, and upon his return in 1702 pub. an account of his journey and researches in his *Diarium italicum*. The greatest and best-known work of this eminent scholar is *L'Antiquité expliquée et représentée en figures* (Paris, 5 vols. fol.), to which, in 1724, was added a supplement in 5 vols. See E. de Broglie, *Montfaucon et les Bernardiens*, 1891.

Montferrat, Duchy of, ter. between Piedmont, Milan, and Genoa, originally independent, but now forming part of the republie of Italy. It had an area of 1300



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THE MEETING OF CORTEZ AND MONTEZUMA II. IN 1519
A modern painting by H. W. Smith.

1436. He extended the Mexican conquest, rebuilt Tenochtitlan, the chief Aztec city, erecting houses of lime and stone on the site of the modern Mexico, and developed the ceremonial of the tribal religion.

Montezuma II. (1466-1520), emperor of Mexico, succeeding his uncle in 1502. He was a great warrior and legislator, but his arrogance alienated the people, and when Cortez landed at Vera Cruz in 1519 and attempted to march on Tenochtitlan, he was well received by the inhab. and made M. his prisoner. M. was restored to his throne as a vassal of Spain, but his subjects revolted and he was killed while attempting to address them.

Montfaucon, Bernard de (1655-1741), Fr. scholar, b. at the château of Soulage, Aude, the son of Timoleon de M., Lord of Roquetaillade and Comillac. He was at first a soldier, and served in Germany under Marshal Turenne, but in 1675 he entered the learned Benedictine congregation of St. Maur. His ed. of Athanasius in Gk. and Lat. (3 vols. fol.) estab. his reputation as a profound scholar. He

sq. m., and its cap. was Casale. A portion of the duchy fell to the dukes of Savoy in 1631, and the remainder in 1703.

Montfleury, Antoine Jacob (1640-85), Fr. dramatist, b. in Paris. He was called to the Bar in 1660, but made his reputation as a dramatist the same year by his comedy entitled *Mariage de Rien*. He wrote numerous dramatic works which are characterised by their originality. Some of them are *Les Hesles riveonnables* (1661); *Le Mary sans femme* (1663); *Thrasphule* (1663); *L'Impromptu de l'hostel de Condé* (1663); *L'Ecole des jaloux* (1664); *L'Ecole des filles* (1666); *Crispin gentilhomme* (1677); *La Dame médecin* (1678); and *La Femme juge et partie* (1669), a comedy in five acts, his masterpiece.

Montfort, name of an anc^t. Fr. family, which is taken from the castle of M. or M. l'Amaury, near Paris. It was founded by Wm., the son of Amaury, Count of Hainault, who married the heiress of M. about 952. Some members of the family are Simon IV, de M. (c. 1180-1218), who took a prominent part in the crusade against the Albigenses; Amauri de M.

(1192-1241), who was made constable of France in 1230; *Guy de M.* (d. 1228), brother of Simon IV., whom he accompanied on his military exploits; *Yolande* (d. 1322), who married Arthur II. of Brittany.

Montfort, Simon de, Earl of Leicester (c. 1206-65), b. in France. He offered his services to Henry III. of England, who was so pleased with the young Fr. noble that he gave him the title of earl of Leicester. He married Elinor, sister to King Henry III. and the youthful widow of Wm. Marshal the younger, earl of Pembroke. After this marriage, which was viewed with disfavour by the king, de M. became a steadfast advocate of the Eng. charter and of the liberties of the people. His character, like Cromwell's, included a strong religious vein, and, also like Cromwell, he could see little security for liberty except in his own virtual dictatorship. In 1257 the king's debts were so great and the rapacity of his foreign relations so unbearable that the people were in a state of insurrection. The barons assembled and, under the direction of de M., held the celebrated parliament at Oxford. They passed statutes to enforce the provisions of Magna Carta. The king swore to observe them, but sent forthwith to the pope praying to be absolved from his oaths. The Bull of absolution arrived. Henry set his barons at defiance, and the war began with the battle of Northampton. At Lewes the royal forces were signally discomfited, and the king was taken captive. The conditions exacted from the king were that he should observe Magna Carta and the charter of the Forests, be moderate in his expenses and grants until his old debts were paid off, and that Englishmen only should be chosen counsellors. The queen (Elinor of Provence), who was in France, now occupied herself in collecting a large army. To deliberate upon the measures to be adopted at this great crisis, writs were issued to the sheriffs, in 1265, by de M., directing them to return two knights for each co. and two citizens or burgesses for every city and bor., and from this time may be dated the recognition of the Commons as an estate of the realm in Parliament. A second war broke out, and this time the popular cause was weakened by defection and treachery. Prince Edward (afterwards Edward I.) encountered the barons at Evesham with a greatly superior army; de M. was defeated and killed. He was denied a grave by the royalists, his head being sent to Wigmore Castle and his mutilated limbs to different tns. See lives by C. Bémont, 1804 (Eng. trans. 1920); G. W. Prothero, 1877; M. Creighton, 1895; T. S. Batsman, 1923; and B. C. Boulter, 1939. See also F. M. Powelke, *Henry III. and the Lord Edward*, 1948.

Montgolfier, Joseph Michael (1740-1810), inventor of air balloons, was b. at Vidalen-les-Annonal, near Lyons, France. In conjunction with his brother, Jacques Etienne, he made his first experiment with a hot-air balloon in 1783. He was also the inventor of a hydraulic machine

called the water-rail. See also AERONAUTICS; BALLOONS.

Montgomerie, Alexander (c. 1556-1610), Scottish poet, b. in Ayrshire, and the brother of Robert M. (d. 1609). He held office in the Scottish court in 1577 and became poet laureate. His chief poem is *The Cherrie and the Sae* (first ed. 1597), written in a fourteen-line stanza (of which M. was the greatest master, if not the inventor), which contains many beautiful passages. Other works are *The Flying betwixt Montgomery and Polcart* (first ed. 1621) and; *The Mindes Melodie* (1605), a version of fifteen of the Psalms, Simeon's song, and the 'Gloria Patri.'

Montgomerie, Archibald William, see EGLINTON AND WINTON, EARL OF.

Montgomery, Gabriel, Comte de (c. 1530-1574), Fr. knight and officer in the Scottish Lifeguard of the king of France. At a tournament given by Henry II. in honour of his daughter's marriage with Philip of Spain, M., at the king's command, entered the lists unwillingly with him and accidentally killed him. M., although blameless, left France, and soon after embraced Protestantism in England. On the commencement of the religious wars in 1562, he returned to France and defended Rouen. In the third religious war M. escaped from the massacre of St. Bartholomew and fled to England. Next year he returned to Normandy, but being compelled to surrender the castle of Domfront, he was carried to Paris and beheaded.

Montgomery, James (1771-1851), Scotch poet and hymn-writer, b. at Irvine, in Ayrshire. He took up journalism, editing the *Sheffield Inv.* In 1806 he produced his *Wanderer of Switzerland*, founded upon the Fr. conquest of Switzerland, and in 1810 pub. another vol. of verse entitled *The West Indies*, in which he appeals for the abolition of the slave trade. These were followed by *The World before the Flood* (1812); *Greenland* (1819), a poem founded on the Moravian missions to Greenland; *Songs of Zion* (1822); and *The Pelican Island* (1826), a poem written in imitation of Shelle, which is generally considered his best work. He also wrote *Lectures on Poetry and General Literature* (1833), and many hymns, upon which his reputation now mainly rests. Some of these are *Songs of Praise the Angels sang; For ever with the Lord; and Go to Dark Gethsemane*. See W. Odem, *The Sheffield Poets*, 1929.

Montgomery, Robert (1807-53), Eng. poetaster, b. in Bath. In 1828 he pub. *The Omnipresence of the Deity, Death, A Vision of Death, A Vision of Hell*, and in 1829 *Satan*, which was scathingly reviewed in an article by Macaulay. This classic castigation, which has perpetuated the memory of its victim from the oblivion it would have earned, appeared in the *Edinburgh Review*, April 1830. With an unfortunate facility in florid versification, combined with muddled metaphor, M. had no genuinely poetic gift. He went to Lincoln College, Oxford, in 1830, was ordained in 1835, and devoted himself zealously to his duties as curate at

Whittington in Shropshire. In 1836 he came to London, and then went to St. Jude's Chapel, Glasgow, in 1838, and back to London again in 1843 to the Percy Street Chapel, St. Pancras. At all these places he drew very large audiences, though his style of preaching is said to have resembled that of his poetical effusions. He was, however, generous and did much to promote charitable causes.

Montgomery-Massingberd, Field-Marshal Sir Archibald Armar (1871-1947), Eng. soldier, b. at Kennington. He was educated at Charterhouse and the Royal Military Academy, Woolwich. Decorated and mentioned in dispatches in the S. African war, in the First World War he became chief-of-staff to Rawlinson's Fourth Army, and took a major part in planning the attack of Aug. 8, 1918, from which followed the breaking of the Hindenburg line. From 1920 to 1922 he was deputy chief of the general staff in India, and in 1928 became commander-in-chief, Southern Command. In 1930 he became adjutant-general, and from 1933 to 1936 chief of the Imperial General Staff, being promoted to field marshal in 1935.

Montgomery of Alamein, Sir Bernard Law, Viscount (b. 1887). Brit. soldier, son of Rt. Rev. H. H. Montgomery, K.C.M.G. Entering the army in 1908, he became lieutenant-colonel in 1931, and colonel in 1934. He served in the First World War, 1914-18, being mentioned in dispatches. He commanded 1st Battalion Royal Warwickshire Regiment, 1931-34; was G.S.O., 1, Staff College, Quetta, 1934-37; commander of 9th Infantry Brigade, Portsmouth, 1937-38. He commanded the 3rd Div., 1938-39, participating with it in the Dunkirk evacuation; corps commander, 1940-41, in Aug. 1942, with the rank of lieutenant-general he succeeded Gen. Ritchie as commander of the Brit. Eighth Army under Gen. Sir Harold Alexander, commander-in-chief, Middle E. Under his command the Eighth Army won one of the most brilliant victories in the hist. of the Brit. Army, when, between Oct. 23 and Nov. 7, the Brit. forces at El Alamein, after repelling all the assaults of Marshal Rommel's mixed Axis forces, turned to the offensive and completely routed the Ger. marshal. M. was knighted in Nov. 1942. In the winter of 1943, after a brilliant pursuit of Rommel's army across Libya and Tripoli, he entered Tripoli and thereby completed the conquest of all Italy's African empire. In March 1943 he again defeated Rommel's reinforced army at the battle of the El Mareth line and followed this with another defeat at Akarit and the capture of the Tunisian ports of Gabes, Sfax, and Sousse. In the summer of 1944 he led the allied armies in the great victory of the battle of Normandy and led the 21st Army Group to the Rhine and across that riv. to the Elbe. After the war he was appointed chief of the Imperial General Staff. In 1948 he became chairman of the commanders-in-chief of the W. Alliance, formed for the defence of W. Europe. A soldier possessing extreme technical

capability, coupled with clear insights into the nature, though not all the details, of modern war. The N. African campaign (*see AFRICA, NORTH, SECOND WORLD WAR CAMPAIGNS IN*), which first revealed his three characteristics, tactical skill, confident resolution, and the intuitive power to use opportunity, showed also how spiritual and intellectual resources could be used to restore and maintain indispensable morale. It was his outstanding campaign, but the battle of Normandy (*see WESTERN FRONT IN SECOND WORLD WAR*) was the greater. The battle plan



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FIELD-MARSHAL MONTGOMERY

here was his; the bolding, offensive-exhaustion battle in the E., combined with a powerful thrust and pursuit in the W. through Brittany, and its relentless execution, secured him a great victory. Whether his own sequel to it, equally relentless pursuit to the Rhine and across, was really feasible is a disputed point; it was possibly more feasible than it looked, but it depended on things outside commander's control, and the Arnhem conception at least failed because of them. On Africa and Normandy M.'s fame securely rests. To brilliant competence M. brought also the personal touch; to the army he commanded M. was a hero, to more than the army he is already a legend. See his *From Normandy to the Baltic* (1947); *From El Alamein to the River Sangro* (1948); and *Forward from Victory* (1948). See also A. Moorehead, *Montgomery, 1946*, and Sir F. de Guingaud, *Operation Victory, 1947*.

Montgomery: 1. Municipal and parl. bor. of Wales, cap. of the co. of the same

name, is placed at the foot of a high and well-wooded eminence, about $1\frac{1}{2}$ m. from the Severn and 168 m. N.W. by N. of London. The anct. castle of M., of which some ruins still remain, was founded by Baldwin, a follower of William the Conqueror. Pop. 900. 2. A dist. and tn. of the W. Punjab, Pakistan, in the Multan div. The dist. has an area of 4754 sq. m., and is situated between the Ravi and the Sutlej. The tn. lies 90 m. S.W. of Lahore, and has cotton and silk manufs. Pop. of dist., c. 800,000; of tn., c. 15,000. 3. State cap. of Alabama, U.S.A., and seat of M. co. It is situated on the Alabama R. at the head of navigation for larger vessels. It is one of the prin. cotton centres of the U.S.A. There are manufs. of fertilisers, syrups, and cotton goods. Its chief buildings are the Capitol and the city hall. It was the seat of the Confederate Gov. in the first part of 1861. Pop.: c. 114,400; tn. 78,000.

Montgomeryshire, inland co. of N. Wales, between Shropshire on the E. and the Welsh cos. Merioneth and Cardigan, on the W. Area 927 sq. m. The surface is almost wholly mountainous (Plinlimmon, 2469 ft.), a large portion consisting of bleak elevated moorlands, but toward the Eng. border there are sev. warm, fertile, and well-watered valleys. The Severn, the Vyrnwy (Liverpool's main water supply), and the Dovey are the prin. rvs. The co. belongs almost entirely to the basin of the Severn. The mineral wealth of M. is not great, but copper, lead, and zinc are procured, and mill-stones, slates, and limestone are quarried. Cattle and sheep, and the pure breed of Welsh ponies called 'Merlins,' are reared. The Welsh flannel manuf. is extensively carried on in the co. The cap. is Montgomery. Other tns. are Welshpool, Llanidloes, Llanfyllin, Newtown, and Machynlleth. The co. sends one member to the House of Commons. Pop. 46,000.

Month (interval of time) is the time which elapses between one new moon and the next. This interval is not constant owing to movements of the moon's orbit relative to the earth. Its mean length is 29-5305887 days. There are five classes of M. 'The sidereal M.' or the time of the circuit of the stars, averages 27-3216614 days; the 'anomalistic M.', or the time of revolution from perigee to perigee, averages 27-554599 days; the 'tropical M.', or the time of passing from any point of the ecliptic to the same again, averages 27-32158 days. The average 'nodical M.', or interval from a node to a similar node, is 27-2122222 days; the 'common' or 'synodic M.' is the interval 29-5305887 days noticed above.

Montherlant, Henri de (b. 1900), Fr. novelist. A Catholic by inheritance, he early asserted that the evangelical spirit lacked virility. Having served in the First World War he returned to celebrate the glories of athletics and the prowess of the human body. His books on the Olympic games, as practised since the First World War, had for object to inspire Fr. youth to cultivate outdoor sports. Much of his best work is partly auto-

biographical. *La Relève du matin* (1920) is a story of college days. *Le Songe* (1922), one of the best Fr. stories of the war, is largely his own story. *Les Bestiaires* (1926) is a Proust-like book filled with the colour and thrill of bull-fighting — M. was himself an amateur bull-fighter. His style is at times inspired by Barrès, Clandel, and d'Aununzio. M. has never quite achieved success in a work of art as such except in *Les Bestiaires*. He tells the truth, brazenly and recklessly, regarding sensations as the only truth.

Monthly Nutation, see under NUTATION.

Montholon, Charles Tristan, Comte de (1783-1853), Fr. general and diplomatist, b. at Paris. He first entered the navy, but later joined the army and served in many campaigns. In 1809 Napoleon made M. chamberlain; he employed him at Wartzburg, 1811-12, and in 1815 M. accompanied Napoleon to St. Helena, and remained with him till his death. With Gen. Gourgaud he pub. *Mémoires pour servir à l'histoire de France sous Napoléon, écrits à Ste. Hélène sous la dictée* (1822-25). M. was Louis Napoleon's chief-of-staff in his attempt at Boulogne (1840), and was sentenced to twenty years' imprisonment at Ham, but released in 1847. He pub. in England *Récits de la captivité de Napoléon* (1817).

Monthyon, see Montyon.

Montier-en-Der, tn. of the arron. of Wassy, dept. of Haute-Marne, France. Nearly half the tn. was destroyed or badly damaged in the Second World War. Pop. 1700.

Montignies-sur-Sambre, tn. in the prov. of Hainaut, Belgium, 2 m. S.E. of Charleroi on the R. Sambre. It has coal-mines, blast furnaces, foundries, plating mills, and quarries of marble and sandstone. Pop. 23,000.

Montigny-en-Gohelle, com. of the Pas-de-Calais dept., France, in the Béthune arron. Pop. 7707.

Montigny-lès-Metz, com. in dept. of Moselle, France, 1 $\frac{1}{2}$ m. S.W. of Metz, on the Moselle; it has railway workshops. Pop. 13,000.

Montilla, tn. of Spain in the prov. of Cordova, and 20 m. S.S.E. of the city of that name. Manufs. of coarse linen and earthenware are carried on. The famous wine, Amontillado, is produced in the vicinity. Pop. 16,800.

Montivilliers, tn. in the dept. of Seine-Inférieure, France, 7 m. N.E. of Le Havre. Pop. 6900.

Monti, Vincenzo (1751-1828), It. poet, b. at Alfonsine, near Ferrara. At the beginning of his career he was secretary to Luigi Braschi, and at that time was a violent enemy of the Fr., but in later life he became a Republican, next a panegyrist of Napoleon, and lastly a eulogist of the emperor of Austria. He was prof. of eloquence at Pavia during the Fr. republic, and during the empire historiographer for Italy at Milan. His *Bassavilliana* (1793), written on the murder of Hugo Bassaville, the Fr. ambas. at Rome, is a wonderful imitation of Dante, and gained him a high reputation. His other chief works were *Il Burdo della Selva Nera*

(1806), a eulogy of Napoleon; *Cantica* (1806), a political poem; a trans. of Homer's *Iliad* (1807); and *Proposta di alcune correzioni ed aggiunte al vocabolario della Crusca* (1817-26), an attack on the pedantry of the Cruscan dictionary. He also wrote the tragedies of *Aristodemo* (1786); *Galeotti Manfredi* (1787); and *Caio Gracco* (1800). His collected works were pub. in Milan (1939-42). See studies by Cantù, 1879; Viechi, 1885-87; Tumbini (3rd ed.), 1894; E. Bevilacqua, 1928; and A. Ponpeati, 1928.

Montlhéry, tn. in the dept. of Seine-et-Oise, France, 17 m. S.S.E. of Paris. There are ruins of an anc. château. Pop. 2609.

Montluc, Blaise de Lasséran (1502-77), marshal of France, b. at St. Géminies, Gers, of an illustrious Gueinne family, and one of the bravest, if cruellest, soldiers of all time. As a captain of infantry, fought under Brissac against the Its., and narrowly missed ending the war by a *coup de main*. He performed brilliant exploits at the head of his arquebusiers at Cérizoles (1544), and again at San Damian, Béne, and Costemiglio. He became lieutenant-general of the gov. of Gullenne (1564), and executed Protestants 'with a ferocious gaiety.' His last military act was the siege of La Rochelle (1573), after which he devoted himself to compiling his *Commentaires* (printed 1592) of memoirs of his military life. These are said to have been described by Henry IV. as the 'soldier's Bible.' Some writers have presented M. in a rather different light, as a faithful and brave soldier, no fanatical Catholic, but (as he says in his memoirs) one whose religion, as well as his body, was 'au service du roi.' It is said that scars covered almost his entire body, and that finally a gun-shot tore away half of his face, compelling him to wear a mask. Directness of speech, a whole-hearted desire to help others to acquire honour and reputation, and rough soldierly humour illuminate his *Commentaires* with much of the 'romance' of war. See ed. of his *Commentaires* pub. in 5 vols., 1864-72.

Montluçon, tn. in the dept. of Allier, France, picturesquely situated on the slope of a hill on the r. b. of the Cher, at the S. extremity of the Canal de Berry, 40 m. W.S.W. of Moulins. It manuf. mirrors, glass, chemicals, and sewing-machines, and trades in corn, wine, and fruits. Pop. 47,000.

Montmartre, N. arron. of Paris, within its fortifications. It is a Bohemian resort of Parisians and visitors. It stands on rising ground, which is surmounted by the Sacré-Cœur basilica.

Montmédy, tn. and second-class fortress in the dept. of Meuse, France. It lies 31 m. S.E. of Sedan, on the R. Chiers. It is defended by extensive outworks, and has a barracks, military hospital, and prison, and manufs. hosiery and leather. Pop. 2000.

Montmorency, Anne Pierre Adrien, first Due de (1493-1567), marshal and constable of France, b. at Chantilly, belonged to one of the oldest and greatest of the noble families of France. He received, it is said, the name of Anne from his god-

mother, Anne of Brittany. He distinguished himself in the wars between Francis I. and the Emperor Charles V., and was taken prisoner along with his sovereign in the battle of Pavia (1525). He afterwards became the leader of the Fr. Gov., and was made constable in 1538; he was suddenly banished from court in 1541, but returned on the accession of Henry II., and was again head of affairs. In 1557 he commanded at the battle of St. Quentin, in which he was taken prisoner. During the minority of Charles IX. M. with the duke of Guise and the Marshal St. André, composed the famous triumvirate which resisted Catherine de' Medici. In 1562 and 1567 he commanded the royal army against the Huguenots, and in both wars gained victories over them, but was fatally wounded at St. Denis, 1567. See F. Decrue, *Anne de Montmorency*, 1885-89.

Montmorency, Henri, Due de (1595-1632), son of Duke Henry I. and grandson of Anne, constable of France. He took part in the religious wars (1621-30), took Rô and Oléron in 1625, and defeated the Piedmontese in 1630. He was made marshal the same year, but being provoked into rebellion by Richelieu, he joined the party of Gaston, duke of Orléans, and placed himself at the head of the insurgent army. He was, however, defeated by Marshal Schomberg at Castelnary in 1632, and, being severely wounded, fell into the hands of the enemy and was beheaded as a traitor at Toulouse.

Montmorency: 1. Riv. of Quebec, Canada, rising in Snow Lake and entering the St. Lawrence, 6 m. N.E. of Quebec. The falls at its mouth are 150 ft. wide and 265 ft. high, and supply electric power to Quebec. 2. Com. in the dept. of Seine-et-Oise, France, 9 m. N. of Paris. The Forest of M. is a favourite resort of the Parisians. It has manufs. of cheap lace and grows famous cherries. Pop. 11,200.

Montone, Braccio di, see BRACCIO.

Montoro, tn. of Spain, in the prov. of Cordova, built on a rocky ridge around which winds the Guadalquivir, 26 m. E.N.E. of Cordova. The heights in the vicinity are clothed with olive plantations, and oil is largely exported from this quarter, as well as cattle and timber. Pop. 21,200.

Montorsoli, Fra Giovanni Angelo da (c. 1507-63), It. sculptor, b. at Montorsoli, near Florence. He studied under Andrea Ferrucci at Fiesole, and worked for Michelangelo at San Lorenzo, Florence. About 1527 he became a monk, and in 1530 was invited to Rome by Pope Clement VII., who employed him to restore some statues. Some of his works are the tomb of the poet Sanza, at Naples; the statue of Andrea Doria, at Genoa; the fountain in the piazza and the facade of the cathedral at Messina; and various statues in the church of the Servites at Bologna. See F. Brinckmann, *Bareckskulplur*, 1919.

Montparnasse, S. quarter of Paris, noted for its graveyard and as an artist's colony.

Mont Pelée, see under MARTINIQUE.

Montpelier, city, cap. of Vermont, U.S.A., co. seat of Washington co., on

the Winooski R. The State Capitol is one of the most magnificent buildings in the U.S.A. In the vicinity are large granite quarries. Pop. 8000.

Montpellier, cap. of the dept. of Hérault, France, is situated on an eminence on the r. b. of the Lez, 30 m. S.W. of Nîmes, and 17 m. N.W. of Céte, the port of this tn. It is irregularly built, with narrow, steep, but generally clean streets, and the houses are mostly well built. It has a cathedral, with no pretensions to beauty or interest; a univ.; an exchange, with a fine Corinthian colonnade; a court-house; a medical school, etc. The botanic garden of M., the earliest collection of the sort in France, was estab. in the reign of Henri IV. There are, among other estabs., cotton and woollen factories, dye-works, paper mills, distilleries, breweries, sugar-houses, and chemical works for the making of alum, Prussian blue, etc. The prin. articles of export, besides the produce of the manufs., are wine, oil, fruits, wool, and other rural produce. Towards the end of the eighth century M. was first raised into the position of an important tn., governed by hereditary lords under the bishops of Maguelonne. At the Reformation a great number of the inhab. became zealous Huguenots. Pop. 93,000.

Montpensier, Anne Marie Louise d'Orléans, Duchess de (1642-1703), known as 'La Grande Mademoiselle,' b. at Paris. She was the daughter of Gaston, brother of Louis XIII. She was an ambitious woman, but much of her energy was wasted in seeking a husband. She aimed at marriage with Louis XIV., but was defeated in this by Cardinal Mazarin (q.v.). This annoyed her, and during the wars of the Fronde (q.v.) she accompanied the army with Condé against the court. She contrived a secret marriage with Lauzun, but he was imprisoned soon after. Her memoirs (pub. 1729) cover the period 1630-88. See *Duc de la Force, La Vie amoureuse de la grande Mademoiselle*, 1927.

Montreal, metropolis of the dominion of Canada, holds a commanding position relative both to ocean and to riv. navigation. Situated on the l. b. of the St. Lawrence R., 1000 m. inland from the Atlantic, it is the second largest E. coast port on the N. Amer. continent, being exceeded only by New York. The city is built on M. Is., a triangular-shaped is. 32 m. long by 7 to 9 m. wide, at the confluence of the St. Lawrence and Ottawa Rs. M. proper has an area of 60 sq. mi. Its built-up areas spread out in all directions from the lower slopes of beautiful Mount Royal, from which the city takes its name. Mount Royal, visible for many miles by air, land, and riv. routes, presents a pleasing spectacle to visitors approaching the city. M.'s beginnings go back to 1535 when Jacques Cartier, sailing up to the mighty St. Lawrence, came upon a large fortified Indian vil., Hochelaga. Seventy-six years later, in 1611, Champlain estab. a trading post on the is., and in 1642 Paul de Chomedy, Sieur de Maisonneuve, founded Ville Marie, subsequently renamed M. The place

remained under Fr. rule until 1763, when Canada became a Brit. possession under the treaty of Paris. It was formerly the federal seat of government, but in 1847 this was removed to Quebec, and later to Ottawa. The Ottawa R., which joins the St. Lawrence both above and below the city, drains an area of about 80,000 sq. m. M., being the highest point to which the St. Lawrence is navigable for sea-going vessels, drawing 18 ft. of water, it may be considered in addition to its pre-eminence as an ocean port as the chief port of the Great Lakes and St. Lawrence R. system.



Canadian Government

MONTREAL

St. James's Street showing the Royal Bank building.

The pop. of M. (1948) was 1,122,295, with a further pop. of 231,736 in the surrounding suburbs. About 66 per cent of the inhab. are of Fr. origin, some 20 per cent are of Brit. origin, the balance being made up of important groupings of other nationalities, thus making M. one of the most cosmopolitan cities in N. America. It is a bilingual city: Fr. and Eng. M. is the largest city in Canada, the furthest inland ocean port in the world, and one of the greatest centres of electrical power resources in the W. hemisphere. From its beginnings as a Fr. colonial settlement, M. has been the cradle of Canadian financial, transportation, and industrial development. Canada's priu. banking and investment institutions are located here. It is the headquarters of the Canadian Pacific Railways and of the Canadian National Railways, and the world headquarters of the International Civil Aviation Organisation. As such, it is the terminal for Amer. Canadian and

Overseas air routes. The Canadian Pacific Railways have a total mileage of 17,169, while the Canadian National Railways have a mileage of 23,691. Ocean, lake, and river transportation also converge at M. The harbour of M., situated on the St. Lawrence R., is reached by ocean shipping through a dredged channel having a minimum depth of 32½ ft., now being completed to 35 ft. It is served by both Canadian railways, connected to the harbour front by 60 m. of terminal railway operated by the National Harbours Board. The harbour is open to navigation from about the middle of April to the beginning of December of each year. Main piers, wharves, and jetties provide 105 berths, totalling about 10 m. of berthing accommodation. There are twenty-six transit sheds, with an average floor area of over 2,063,000 sq. ft., also four grain elevators, with a total storage capacity of over 15,000,000 bushels; 3½ m. of grain conveyor galleries; a cold storage warehouse, with a capacity of 4,628,000 cu. ft. A 7-ton capacity floating crane and ten locomotive cranes are available. During the 1948 port season shipping was as follows: there were 4049 arrivals, with a total net registered tonnage of 5,823,270 tons. The value of merchandise exported through the port (1947) amounted to \$536,361,814, while imports totalled \$450,313,797. In 1946 there were 4074 industrial estabs., employing 197,413 employees. The gross value of production amounted to \$1,400,035,768. The leading industries by gross value of products are as follows: women's clothing, \$114,927,598; railway rolling stock, \$83,018,858; men's clothing, \$67,749,062; slaughtering and meat packing, \$59,532,900; electrical apparatus and supplies, \$52,176,876; tobacco, cigars, cigarettes, \$51,071,227; boots and shoes, \$33,828,882; breweries, \$28,652,517; fur goods, \$25,139,379; paints and varnishes, \$20,664,127; biscuits and confectionery, \$20,335,637; medicines and pharmaceuticals, \$20,123,701; printing and publishing, \$19,164,747. It is estimated that there is available in the prov. of Quebec, of which M. is the chief industrial centre, a potential 13,064,000 electrical h.p., of which 5,750,000 h.p. has already been developed, or more than half of the total for all of Canada. M. is also the transportation centre of the dominion. In the city there are 450 m. of tramway track and bus routes comprising ninety-two regular circuits. Some 1550 transit vehicles carry approximately 1,100,000 passengers per day.

The civic gov. of M. differs from that of most Amer. and Canadian cities. In some ways it resembles the local govs. of the larger United Kingdom cities and in other respects it is similar to that of continental cities. For electoral purposes the city is divided into eleven dists., each of which sends six members to the city hall. Three of these are elected by property owners and three by the electors at large. In addition thirteen public bodies appoint thirty-three representatives to the city council. The total membership of the council is, therefore,

ninety-nine councillors, plus the mayor of the city, who is elected by majority vote of the electors at large. The day-by-day administration of the city is entrusted to an executive committee, the seven members of which comprise the mayor of the city and two delegates from each of the three categories of civic groups mentioned above. The actual executive administration rests upon eleven civic dpts.: law, health, public works, city clerk's office or secretariat, finance, city planning, welfare, assessors, purchases and stores, police, and fire. These dpts. are in turn co-ordinated by the central figure of the city's permanent civil service, namely the director of dpts.

Noted for its many beautiful public buildings, some of the more imposing are Notre Dame Church (Rom. Catholic), Christ Church Cathedral (Church of England), St. James Cathedral (Rom. Catholic), Church of St. Andrew and St. Paul (Presbyterian), Sun Life building, Royal Bank, Bell Telephone, Civic Library, and M. Art Association. McGill Univ. (founded 1811) and the univ. of M. (founded 1878) are located in the city as are a number of other educational institutions. St. Joseph's Oratory, internationally famed shrine, which annually attracts thousands of visitors, is located in M. An is.-city, there are numerous bridges connecting it to the mainland. Victoria bridge, completed in 1859, marked one of the great engineering achievements of the nineteenth century. Originally a tubular bridge, its total length of 9184 ft. has been replaced by one of cantilever design. Jacques Cartier bridge, completed in 1930, of cantilever design, is 8670 ft. in length, constructed in three sections, the central span of which rests on St. Helen's Is. It was on this is., a legend says, that Chevalier de Lévis buried his flags so as not to surrender them to the Brit. In 1760, M. still retains much of its old-world atmosphere. After Paris it is the second largest Fr.-speaking city in the world. See H. Beaugrand, *La Vieux Montréal*, 1884; A. Leblond de Brumath, *Histoire populaire de Montréal*, 1890; S. Lenock, *Montréal: Seaport and City*, 1942; V. Morin, *The Historical Records of Old Montréal*, 1944; W. P. Percival, *The Lure of Montréal*, 1945; and M. Gibbon, *Old Montréal*, 1948.

Montreuil, or Montreuil-sous-Bois, tn. in the dept. of Seine, France, 1½ m. E. of Paris. It is famous for its peach orchards, and has gypsum quarries and manufs. of porcelain, paints, and chemicals. Pop. 69,800.

Montreuil-sur-Mer, tn. in the dept. of Pas-de-Calais, France, 24 m. S.E. of Boulogne, with which it is connected by rail. It is founded on a seventh-century monastery built by St. Saulve. The church of St. Saulve was founded in 1200 and rebuilt in the nineteenth century. The château of Beaurepaire was occupied as the Brit. G.H.Q. from 1916 to 1919. Pop. 2800.

Montreux, par. at the E. end of Lake Geneva, canton of Vaud, Switzerland, which includes the vlls. of Clarens,

Vernex, Territet, Gilon, Veytaux, and others. It is a favourite winter resort. Near Veytaux is the castle of Chillon. Pop. 12,000.

Montrose, James Graham, fifth Earl and first Marquess of (1612-50), was educated at the univ. of St. Andrews. After three years' travel on the Continent he had an interview, in 1636, with Charles I., who, however, gave him but a cool reception. Actuated by this contemptuous treatment by the king, but more by his discontent with the political supremacy of the bishops and his desire to give a greater independence to his countrymen, he joined the national movement, assisted at the signing of the covenant (1638), three times occupied Aberdeen for the Covenanters, and finally overthrew Viscount Aboyne, Charles's lieutenant in the



JAMES GRAHAM, MARQUESS OF MONTROSE.

N., at the bridge of Dee (1639). M. now came a second time into personal contact with the king and hence, according to the Presbyterians, arose his great apostasy. M. definitely joined the king in 1641, and was imprisoned the same year for six months in consequence of a supposed conspiracy against Argyll. In 1644, with the rank of lieutenant-general and the title of marquess, he defeated the covenanting forces at Tippermuir and Aberdeen, and in the following year won four other pitched battles at Inverlochy, Auldearn, Alford, and Kilsyth. His subsequent attempt to raise the royalist standard in the Lowlands was an utter failure, and in 1645 he suffered a crushing defeat at Philiphaugh; next year he was a refugee in Norway. The responsibility for this sudden and disastrous reversal of fortune rests in part on the ill-fated M. himself. He had been blind to the fact that, while Highland troops might perform unheard-of deeds of daring to defend their clannish honour, they were incapable of disinterested combination to further a national cause, and he had, moreover, been powerless to restrain the wanton carnage which had been the regrettable sequence to all

his victories. M. was in the Low Countries when he heard of the king's execution. He swooned at the news, and swore a great oath to avenge the martyr's death. In 1650 he landed in Caithness with a mere remnant of the little army he had collected, for he suffered shipwreck on the way, and was easily vanquished by Strachan's horsemen at Invercarron. The same year he was hanged in the Grassmarket, Edinburgh. Thus ended 'a life of meteoric splendour.' The title of earl of M. dates from 1505, when Wm. Lord Graham, a title dating from 1445, was made earl of M. John, third earl, was regent of Scotland and chancellor, 1603-8. James, the fourth marquess, and a supporter of the union of 1707, was made a duke in that year. See Lives by Lady Violet Greville, 1886, and M. Morris, 1892. See also M. Napier, *Montrose and the Covenanter*, 1838; G. Wishart, *James, 1st Marquis of Montrose*, 1903; and H. Prysse, *The Great Marquis of Montrose*, 1912.

Montrose, royal burgh and seaport of Angus (Forfarshire), Scotland, 42 m. S.S.W. of Aberdeen. It stands at the mouth of the N. Esk, where it forms the M. basin. The tn. received its charter from David I., and became a royal burgh in 1352. It is rich in historic memories. Industries include timber and flax spinning. Pop. 11,000.

Mont St. Jean, vil. of Belgium, in the prov. of S. Brabant, 11 m. S.E. of Brussels, and just E. of the scene of Waterloo.

Mont St. Michel, granite islet in the bay of St. Michel, near the mouth of the Couesnon, 15 m. S.S.E. of Granville, in the dept. of Manche, France. It is connected with the mainland by a causeway 1 m. in length. The is. rises to a height of 240 ft., and is crowned by a Benedictine monastery dating from the eleventh century. The quicksands that surround the is. are exposed at low water, and highly dangerous, whilst the tide comes in at a great speed. It was held by the Gers, for four years, following the collapse of France in 1940, and liberated early in Aug. 1944, soon after the fall of Avranches and Pontorson. Pop. 250.

Montserrat (Spain), see MONSERRAT.

Monserrat, is. of the Brit. W. Indies, one of the presidencies of the Leeward Is.; it lies in lat. 16° 45' N. and long. 61° W., and has an area of 32 sq. m. and a pop. of 14,000. It is entirely volcanic, and has sev. groups of mts., the highest elevation being the Soufrière (3000 ft.). In the S. Forest clothes the summits of the main ranges and streams are plentiful; but the land of the N. hills is treeless and dry. The climate is comparatively cool and healthy, and the mean ann. temp. is 78° F., and the rainfall from 40 to 80 in. The cultivation of sea is. cotton is the staple industry, and over 4000 ac. are under this crop. M. is the largest producer of this commodity in the Brit. W. Indies. Its output just before the Second World War being nearly 70,000 lb., the next best being that of St. Vincent, 420,000 lb. The cultivation of limes, begun in 1852, is the next most important industry, the is.'s

lime-juice cordial being very well known. M. has an executive and a legislative council, over which a commissioner presides, in the absence of the governor of the Leeward Is. Plymouth, the cap. (pop. 2000), is on the S.W. coast, and has an open roadstead. The is. was once strongly fortified, and the ruins of many forts and batteries, including Fort Barrington and Fort St. George, are interesting places for tourist visits. Beautiful tropical scenery repays a drive across the is. to Harris vil. 4 m. from Plymouth, in the hills near the middle of the is. M. was discovered by Columbus in 1493, on his second voyage, and named by him after a mt. near Barcelona, which he thought it resembled. It was first colonised by the Eng. under Sir Thomas Warner in 1632, though it is probable that D'Esnebuc, the first Fr. coloniser in the W. Indies, effected a short-lived settlement there in 1629. It was certainly captured by the Fr. in 1664, and probably at one time (c. 1665) attacked by De Ruyter; but the early records of the is. were destroyed in a disastrous fire in 1724, so that the facts are somewhat obscure. It is estab., however, that Warner's colonists were a body of Irish people who had been causing trouble in St. Kitt's with other Rom. Catholics. Even to this day the people of M. speak with an Irish brogue. In 1667 the Fr. under de la Barre suddenly appeared off the coast with a large force of ships and an army of 3000. The Eng. offered a stout resistance, but most of the Irish, who greatly outnumbered them, went over to the enemy, and the is. was captured. In 1668 the is. was restored to England, and remained in Eng. hands until 1782, in which fateful year of Brit. W. Indian hist. it again surrendered, together with a number of other Brit. is., to the famous and gallant Marquis de Bouillé. Under the treaty of Versailles in the following year, however, it was again restored. Rodney's great naval victory ensuring that result (see SAINTS, BATTLE OF THE). Since then it has remained a Brit. colony. See G. Mannington, *The West Indies*, 1930, and A. M. Alberda, *Histoire de Montserrat*, 1931.

Mont-sur-Marchienne, tn. in the prov. of Hainaut, Belgium. 3 m. S.W. of Charleroi. It has coal-mines, coke-plants, quarries of freestone, and grit, plating mills, foundries, and manufs. of machinery. Pop. 11,000.

Montucla, Jean Étienne (1725-99), Fr. mathematician, studied classics and mathematics at the Jesuits' college of Lyons, his native tn. In 1758 he pub. his great *Histoire des mathématiques*, afterwards completed by Lalande, and twenty years later he issued a much-improved ed. of Ozanam's *Récréations mathématiques* (4 vols.).

Monumenta ecclesiæ liturgica, ed. of old liturgical texts begun in Paris by the Benedictines F. Cabrol and H. Leclercq in 1902.

Monumental Brasses are plates engraved with an inscription, figure, or similar symbol of a departed person of whom they serve as memorials. Though

invariably spoken of as brasses, the material from which the plates are made is not brass at all. It was anciently known as latten, and consists of an alloy of about three-fifths copper, three-tenths zinc, and one-tenth lead and tin. Brasses probably began to be used as memorials in England about the beginning of the thirteenth century, but it was not until the reign of Edward I. that they became common. The earliest brass remaining, that of Sir John Daubernoun (1277) in the church of Stoke D'Abernon, Surrey, belongs to this reign. The art of brass-making reached its height in the period 1372-99. There are slight declines and revivals until the time of James I., when the art rapidly declined, to disappear finally in the eighteenth century. See *Transactions of the Monumental Brass Society* (in progress) and M. Stephenson, *Monumental Brasses in the British Isles*, 1926.

Monuments (Lat. *monumentum*, memorial), any memorial of a durable nature erected to perpetuate the memory of a great person or event.

Monuments, Ancient. The Ministry of Works is empowered under the Ancient Monuments Act, 1931, and under the Consolidation and Amendment Act, 1913, to grant state protection to such M. as are of national importance (and certain others). Lists of the M. are pub. from time to time by H.M. Stationery Office, and the interest of the owners and others is thus enlisted. The Acts also minimise the dangers of unsuitable treatment and of exploration by unqualified persons. Much has been done along these lines in recent years, and public interest in ant. remains of all kinds is growing. The ministry, through its inspectorate of A. M. (in England, Scotland, and Wales), is able to give expert advice on treatment, and in limited cases guardianship is accepted and preservation work carried out at the cost of the state. A few M. are in the custody of the ministry by deed of gift, while others are the property of the Crown as such. Some buildings in occupation are also in charge of the ministry, e.g. the Banqueting Hall and the Horse Guards, Whitehall, London; the Royal Hospital, Chelsea; the Royal Naval College, Greenwich; Hampton Court Palace; Holyroodhouse, Edinburgh; and Dunblane and Glasgow Cathedrals.

In 1938 the list included more than 5300 M. of all kinds, ranging in date from prehistoric camps, megaliths, and tumuli, to the remains of castles, monastic houses, bridges, and even relatively modern buildings. It provides a most useful indication of M. of all kinds in Great Britain. It should be noted that a structure occupied as a dwelling other than by a caretaker cannot in general receive protection under the Acts.

For more than thirty years the Royal Commission on Historical M. has been engaged in making an exhaustive and authoritative first-hand survey of the ant. and historical M. and constructions yet remaining in Great Britain. The scope of the survey extends from pre-

historic times down to the beginning of the eighteenth century, and it embraces as far as is possible every object that may throw light on the past life of the country. In addition therefore to castles, churches, monastic buildings, manor houses, and cottages, a full description is also given of prehistoric camps, burial places, and to other notable field antiquities. The inventories, pub. by H. M. Stationery Office, are magnificently illustrated by original photographs. They cover England, Scotland, and Wales.

Since its inception in 1900 the *Victoria County History*, a large series of vols. in which one or more deal with each co., has pub. information about A. M. While the earlier vols. are not altogether satisfactory, the most recent, pub. under the auspices of the Institute of Historical Research, include authentic period studies, as well as a detailed topographical record. In this hist. the cos. of Berkshire, Devon, Somerset, Hereford, Stafford, Dorset, Cornwall, Gloucester, Shropshire, Worcester, London, Middlesex, Surrey, Kent, Buckingham, Oxford, Hertford, Cambridge, Norfolk, Suffolk, Essex, Lancaster, York, Durham, and Sussex have received attention.

A. M. are recorded on the gov. ordnance survey maps. There are special period maps, e.g. Rom. Britain, Britain in the Dark Ages, Neolithic Wessex, Trent Basin, Celtic earthworks of Salisbury Plain, which show the distribution and geographical setting of various classes of M. On the general maps M. may be recognised by the lettering used to describe them: all prehistoric remains (*i.e.* before A.D. 43) are lettered in O.E.; Rom. remains (A.D. 43 to A.D. 420) are in Egyptian characters; while Ger. text is used for Saxon and medieval remains down to A.D. 1700. The following are the officially accepted terms used on the maps to denote archeological remains: long barrow (where the barrow is of earth); long cairn (where the barrow is chiefly of stones); horned cairn (a Scottish variant); burial chamber (this replaces the old-fashioned terms of dolmen and cromlech); standing stone; stone circle; stone avenue; tumulus (burial mound); camp; earthwork; Rom. road (course of, or probable course of), castle mound. Where possible the age is indicated as palaeolithic, prehistoric, Romano-Brit., Rom., Saxon, or medieval, and in cases of doubt the term 'ancient' is used.

Among the most famous A. M. in Britain are Hadrian's Wall; Stonehenge; Chedworth Rom. Villa; Maiden Castle Camp, Dorchester; Chichester Market Cross; and Netley, Tintern, Fountains, and Rievaulx Abbeys.

In the U.S.A. certain A. M. are protected by regulations which vary from state to state. The sites of some of the famous battlefields of the War of Independence and of the Amer. civil war are vested in historical and archaeological societies. A list of public M. is issued in the Statistical Abstract of the Dept. of Commerce. In France the Ministry of Fine Arts normally assumes responsi-

bility for the care of national M. where there is risk of their neglect. In pre-war Germany great care was taken in the preservation of A. M. New housing schemes were not allowed to interfere with structures of interest; landowners were compensated by the state for loss of their land, while owners of M. of importance who were not able to maintain them in proper condition received financial aid from the gov. There was a wide education in the appreciation of such remains; even the workmen on housing sites were exhorted by propaganda posters.

See also HADRIAN'S WALL; MEGALITH; MENHIR; STONEHENGE, etc.

Monza, tn. in the prov. and 10 m. N.N.E. of the city of Milan, Lombardy, Italy. The cathedral of San Giovanni, founded by Queen Teodolinda in 595 and rebuilt in the fourteenth century, contains the famous iron crown of Lombardy. There are manufs. of silk, woollen and leather goods, and hats. King Humbert of Italy was assassinated here in July 1900. Pop. 45,000.

Monzonite (derived from Mt. Mouzoni, Tyrol, where it was discovered), plutonic igneous mineral, intermediate in chemical composition between the diorites and syenites. It is a grey-green compact mineral, resembling hornfels. Hardness, 6; sp. gr., 3; translucent in thin fragments. Composition: silica, 52·60; alumina, 17·10; protoxide of iron, 9·0; magnesia, 2·10; lime, 9·65; soda, 6·60; potash, 1·90; water, 1·50; - 100·45. In Argyll olivine Ms. are found of an unusual type, consisting of olivine and green augite, as well as orthoclase and plagioclase felspar, which latter occur in all M.

Moody, Dwight Lyman (1837-99). Amer. evangelist, b. at Northfield, Massachusetts, U.S.A.; opened a Sunday school in Chicago in 1855, which subsequently developed into the Chicago Avenue Church. After controlling the Young Men's Christian Association there for four years (1865-69) he was joined by Ira David Sankey. Together they wrote the Moody and Sankey 'gospel hymns,' which were so characteristic a feature of their revivalist meetings both in England (1873, 1881, and 1892) and America. See life by W. R. Moody, 1930.

Moody, William Vaughan (1869-1910). Amer. poet and playwright, b. at Spencer, Indiana; graduated at Harvard Univ., 1893. He was for some time assistant prof. of rhetoric at the univ. of Chicago. Among his works are *A Masque of Judgment* (1900); *Poems* (1901); *History of English Literature* (1907); *The Great Divide* (1907), a play which caused a great sensation; and *The Faith Heater* (1909).

Mooi River Dorp, see POTCHEFSTROOM.

Mooltan, see MULTAN.

Moon, William (1818-94), Eng. inventor of M.'s embossed type for the blind, b. in Kent. Becoming totally blind in 1840 he set about producing an embossed type for those so afflicted, and in 1845 brought out his system, which differed from former systems in almost

entirely discarding contractions. His first pub., *The Last Days of Polycarp*, appeared in 1847, followed by *The Last Hours of Cranmer* and other books of devotion. He also issued an ed. of the Bible, and extended his system to foreign languages, beginning with Irish and Chinese. He was made a fellow of the Royal Geographical Society in 1852, and of the Society of Arts in 1859.

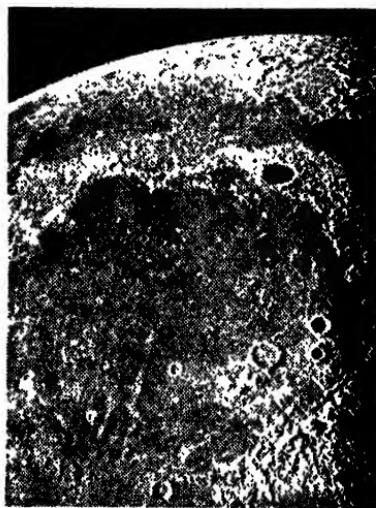
Moon, Mountains of the. From classical times Africa, with its geography hidden beyond the Sahara, has been the source of mythical legends, some based on truth. The sources of the Nile remained undiscovered till 1861, when Capt. Speke explored the region S. of Lake Victoria Nyanza. Ptolemy and all other geographers had placed the source in the mts. of the M., and these were mapped E. and W. in equatorial Africa. There was nothing but rumour and legend, based probably on information 'passed down' among African tribes to Egypt. Capt. Speke considered the crescent of mts. explored by him N. of Lake Tanganyika to be part of them. Dr. Beke considered them to be a N. and S. extension of the Abyssinian plateau. They are now generally identified with the group round Mts. Kenya and Kilimanjaro, or the group round Ruwenzori further W. The latter is more probably correct.

Moonstone, variety of orthoclase, yielding moon-like white reflections. The best specimens, which are used in jewellery, are found in Ceylon.

Moon, The. satellite of the earth, was observed for the first time through a telescope by Galileo in 1610. Galileo came to the conclusion that it was a body that resembled the earth in many respects. The M. is generally believed to have been formed from the earth (see under ASTRONOMY), but the manner of its origin is still unsettled. Its real diameter is 2160 m., rather more than a fourth of that of its parent, while its mass is 7.27×10^{16} tons, about an eightieth of that of the earth. It follows that the gravitational attraction at a point on the surface of the M. is only a sixth of the gravitational attraction at a point on the surface of the earth and, as a result, the M. has no atmosphere. Further, there is no evidence of the presence of water on the M., either as vapour, liquid, or solid. These two facts taken together imply that life as we know it does not and cannot exist on the M. As will be seen from the astronomical details given below the M. rotates on its axis in about twenty-seven days; and that any point of the M. is in darkness for nearly fifteen days, when it emerges to enjoy fifteen days' bright sunshine. These alternations of long nights and days mean that the variations of temp. on the surface of the M. are enormous. The nature of its surface and the absence of any protecting atmosphere make for intensely cold 'nights' and unbearably hot 'days.'

Viewed through a telescope of moderate magnifying power the rotundity of the M. is well shown and its surface features are readily distinguished. The 'man in the M.' is seen to consist of enormous volcanic

craters and mt. ranges, whose details are made so clear when viewed through the most powerful of modern telescopes that their heights have been computed. Magnificent photographs have been obtained by these telescopes that bring the M. to a virtual distance of 250 m. from the earth, and the details of its surface can be most easily seen sev. days before or after full M. when the sun's light falls obliquely on its surface, casting shadows of its mt. ranges that show up in bold relief. The surface is seen to be broken and uneven. Large shallow depressions, named *maria* by Galileo, the dull patches visible to the



E.N.A.

THE SURFACE OF THE MOON

The photograph shows several ranges of mountains and craters, some of which are over 100 miles in diameter.

naked eye, mts., valleys, plains, are to be seen; but evidences of volcanic action, in the form of volcanoes, cracks, and fissures, far transcending anything of the kind on the earth, form the most striking feature. Over 30,000 craters, some of over 100 m. diameter, are grouped and ranged on the side of the M. that we can see. If, as some astronomers believe, these craters are due to volcanic action, we need not be surprised to find that they are much larger than terrestrial craters, for, as mentioned above, the force of gravity on the M. is only a sixth of that on the earth. Nevertheless it is true that it is difficult to account for their enormous size on these grounds alone. The volcanic theory of their origin is, however, more acceptable than the alternative theory that they were caused by external forces such as meteoric bombardment. Other features of the M.'s surface are rills (deep crooked valleys).

clefts of unknown depth, some half a mile wide and sev. hundred miles long; rays, light coloured and brilliant streaks, radiating from the craters. Ten ranges of mts. are noted, and heights are estimated by micrometer measurements of the shadows cast by the light from the sun. The Leibnitz range is the highest, its culminating peak being some 33,000 ft. above the neighbouring valley. Names have been given to each and all of the craters, mts., etc., on the M., and its surface has now been mapped carefully.

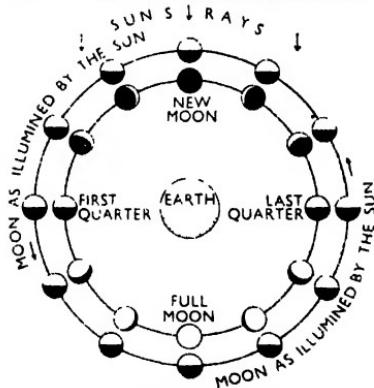
The M. revolves round the earth in a period of 27 days, 7 hrs., 43 min., 11 $\frac{1}{2}$ sec., but eccentricity of orbit and 'perturbations' cause this to vary by as much as 3 hrs. The ordinary month is its synodic revolution period of mean value 29'53 days—the period from one phase to the same phase again.

Apparent Motions, from E. to W., rising and setting 51 min. (mean, varying greatly) later each day; the 'circle' is in a plane inclined to the equator from 28°6' to 18°3': during the month its declination varies from +28°6' to -28°6'; this variation gradually decreases over a period of 93 years to +18°3', and causes great variations in retardation of rising and setting, most striking when the M. is at full. When the full M. occurs near the time of autumnal equinox, i.e. when it is near the First Point of Aries, it rises for some nights at much the same time and 'coasts along' the horizon. This is the harvest M., the full M. nearest to the autumnal equinox. The next full M. is the hunter's M. The M. revolves around the earth from W. to E., moving on the average more than 12° a day. Hence each night our satellite is further E. than on the previous night at the same time, which accounts for the retardation in the rising of the M.

True Motions.—(1) Revolution in an orbit round the earth, the shape of which is found from the variation in the apparent diameter of the M., ranging from 29' 21" to 33' 30"; it is elliptical with an eccentricity to $\frac{1}{2}$; the line of the apsides (q.r.) moves round eastwards in about nine years. The mean distance of the M. from the earth is 238,857 m. (maximum, 252,972 m.; minimum, 221,614 m.); orbital velocity, 2288 m.p.h.; mean horizontal parallax, 57' 2", giving that of the earth at the M.'s surface, 17 17'. (2) Axial rotation in exactly the same time as the period of sidereal revolution whereby it presents always the same aspect to us. Actually we are enabled to see on the whole 50 per cent of the total surface, 41 per cent constantly turned towards us, 18 per cent visible at times. This is due to three librations. The first arises from the inclination of the M.'s axis to its orbit, about 83°, as a result of which the N. and S. poles are alternately turned towards and from the earth. This libration in lat. enables us to see about 6° beyond the M.'s N. and S. poles at different times. The second—libration in long.—is due to the fact that the M.'s rotation in a sidereal month does not keep in exact step with its revolution throughout the month, though they coincide at the end.

Consequently we are able to see about 7° in long. around each edge of the M. more than we could see without this libration. The third—the diurnal libration—is produced by the earth's rotation. We see the M. from slightly different directions from hour to hour and hence at one time observe objects on her surface, just round the rim on the other side, which cannot be seen at another time, and in fact when the M. is rising we see 57' round the W. edge and when setting 57' round the E. edge.

Phases.—These are due to the varying angular distance from the sun. At new M. it is zero; at full, 180°; half M., 90°, the positions being called conjunction, opposition, and quadrature respectively. The accompanying diagram shows these and the phases. The M. is shown on its orbit viewed from outside the whole system, while the outer series shows the views, for corresponding positions, from the earth. It will be observed that (1) the 'horns' are always turned from the sun; (2) the waxing M. has its right side illuminated, the waning M. its left. When less than half of the illuminated side is seen it is called the crescent, when more, the gibbous M.



THE PHASES OF THE MOON
The inner circle shows the moon as seen from the earth.

Light of the full M. \approx 1/1000 of the direct rays of the sun; *albedo* (g.r.), 0.074—about the reflecting power of light-coloured sandstone, but there are great variations.

Lunar Theory (i.e. that branch of lunar study which is concerned with the motions of the M.) is not yet perfect. The 'perturbations' or irregularities of movement due to disturbing influences are not fully accounted for or accurately predictable by the theory of gravitational attraction (see Bibliography). The lunar theory does not form a well-defined body of doctrine, as do other branches of mathematical science, but is in effect a series of researches over more than twenty centuries which are hardly susceptible of being summarised into a consistent whole. This arises from the fact that no one method or system has yet been formulated by which

all the inherent difficulties can be overcome; and each investigator, who has made an appreciable advance on his predecessors, has found himself compelled to approach the subject from a new point of view and to devise a method suited to his special object.

The most up to date and authoritative work on this subject is that of Prof. E. W. Brown of Yale Univ. His *Tables of the Moon* take into account about separate terms and has saved computers much time and labour.

The Future of the Moon.—The influences of the M. on the earth, besides magnetic disturbances, are comprised in tides (q.v.), that are principally caused by the M. The effect of the tidal friction between the oceans and the solid earth is to slow down the earth's rotation so that our days are gradually lengthening. Ultimately two things will happen (provided always that no comet or celestial body disturbs the M. or the earth), and Sir James Jeans has pointed out that the chance of such an event is ridiculously small). In the first place after thousands of millions of years the terrestrial day and the lunar sidereal day will each be equal to the time of revolution of the two bodies about each other and their period will be about forty-seven of our present days. The earth will always present the same face to the M. and the M. the same face to the earth, so that the inhabit. (if any) of one hemisphere will never see the M., while the inhabit. of the other hemisphere will see it every night. The distance between the M. and the earth gradually diminishing after the above stage has been reached, in the end the M. will approach within 12,000 m. of the earth and the gravitational attraction will then be large enough to shatter the M. into fragments that will continue to describe orbits round the earth and form a 'Saturnian' ring. Research on the problems of travel to the M. is proceeding, and the development of rocket propulsion and atomic energy makes it possible that solutions can be found. The dispatch of radio-controlled rockets equipped with cameras and television apparatus would be a first step, and landings on the M. by human beings are not beyond the bounds of probability (see INTER-PLANETARY SOCIETY, BRITISH; ROCKETS).

Moon-worship and Myths.—The worship of the M., as of other heavenly bodies, was one of the earliest forms of polytheism. It prevailed widely among the E. nations and under many aspects. In Egypt Isis was identified with the M. In Phoenicia Ashtoreth, as the feminine equivalent of Baal, was the M.-goddess. In Assyria Sin was the M.-god. Mt. Sinai is supposed to have derived its name from this god, to whom worship was paid there. Not a few names, however, manifest the prevalence of his worship, e.g. Sennacherib (meaning 'the M.-god has increased brothers'). Jericho, by its name, would seem to have been the seat of M.-worship in times before the Israelite conquest. Cautions against the worship of the M. and punishment by death for the convicted worshipper are to be found in

Deut. iv. and xvii.; whilst a superstitious salutation of the M. by kissing the hand is mentioned in Job xxxi. 26-27. In the O.T. we meet more than once with crescent-shaped ornaments (Judges viii. 21 and 18; iii. 18), but whether these are an indication of the worship of the M. is uncertain. Language which was probably derived from the appearance of the M. during eclipses is used by the prophets—the M. is to be darkened or turned into blood before the 'terrible day of the Lord' (Joel ii. 10 and 31). In the figurative language of Scripture the M. is frequently noticed as presaging events of the greatest importance through the temporary or permanent withdrawal of its light. Even in the seventeenth century in England the M. was supposed by the common people to have much influence over human affairs. Various activities such as gathering herbs, slaughtering animals for food, or taking particular medicines were regulated by the 'age' of the M., and these set periods were thought to be a necessary part of practical knowledge, ignorance of which infallibly entailed loss. Some of these superstitions prevailed even later, especially in the Scottish highlands, and throughout Scotland the waning M. was believed to have an evil influence, while full M. was thought to be the most favourable season for initiating an enterprise. The belief that the changes of the M. influence the weather is really little better than a superstition, for the only actual influence is a slight tendency to dispersion of cloud shortly after full M. There are numerous lunar myths from very early times and among many widely different races and countries. In Gk. myths the M. loved Endymion (q.v.) and was bribed to be the mistress of Pan by the present of a fleece, like the Dawn in Australia, whose unchastity was rewarded by a gift of a red cloak of opossum skin. Both solar and lunar myths usually account for the observed phenomena of eclipse, waning and waxing, spots on the M. and so on, by various mythical adventures of the animated heavenly beings. Thus in the Andaman Is. the sun was held to be the wife of the M., and among aboriginal tribes in India the M. was the sun's unfaithful bride whom he cut in two but occasionally allows her to shine in full beauty. In late modern folk-lore the M. is a place to which the wicked are consigned, rather than the impersonation of a man or woman. The mark of the hare in the M. has impressed the imagination of Mexicans, Bantus, Siamese, and others in bygone times and evoked myths among all of them. See also POLYTHEISM.

See H. Spencer Jones, *General Astronomy*, 1922, 1934; T. E. R. Phillips and W. H. Stevenson, *The Splendour of the Heavens*, 1923; H. Macpherson, *Modern Astronomy*, 1926; Sir J. Jeans, *The Universe around Us*, 1929, 1943; W. Goodacre, *The Moon*, 1931; Sir F. Dyson and R. V. d. R. Woolley, *Eclipses of the Sun and Moon*, 1937; and J. B. Sidgwick, *The Heavens Above: a Rationale of Astronomy*, 1948.

Moore, Albert Joseph (1841-93), Eng. painter, b. in York, youngest son of Wm.

M., of York, a painter, most of whose sons were also painters. The mural decorative work he executed at Coombe Abbey for the earl of Craven, and in the chancel of St. Alban's Church, Rochdale, influenced all his later pictures. The supreme merit of 'Sea Gulls' (1871), 'Blossoms' (in the National Gallery, 1881), 'Dreamers' (Birmingham Corporation Gallery, 1882), and 'A Summer Night' (Liverpool Corporation Gallery, 1890) is the harmonious blend of delicate colour, combined with graceful posture and charming lines of drapery.

Moore, Edward (1712-57), Eng. dramatist and man-of-letters, b. at Abingdon, Berkshire. Garrick played the part of Beverley, the gambler, in M.'s once popular tragedy, *The Gamester* (1753), and Horace Walpole and the Lord Chesterfield and Lyttelton contributed to his weekly journal, *The World* (1753-57).

Moore, George Augustus (1852-1933), Irish novelist, b. in co. Mayo. He was intended for the army, but his own inclination was towards painting, though he began by writing poetry: his *Flowers of Passion* appeared in 1878. As a young man he studied painting in Paris, and *Modern Painting* (1893) displays his intimate knowledge of the work of contemporary artists. He remained in Paris for ten years, but was recalled to London as a result of the Land League agitation; he had already decided that he was not a painter. His first book, *A Modern Lover* (1883), appeared while he was living in lodgings in impoverished circumstances. This, and other books, earned him the heated opposition of librarians and others, but his success gradually enabled him to ignore the Puritans and Philistines. *Confessions of a Young Man* (1886, revised 1904 and 1916) is a record of his early life; by its frankness and unconventionality it aroused much discussion. His lively interest in the Irish movement is shown by his comedy, *The Bending of the Bough* (1900), *Diarmuid and Grania* (1901), in which W. B. Yeats collaborated, and *Hail and Farewell*, comprising *Ire* (1911), *Salte* (1912), and *Fale* (1914), a trilogy of candid autobiographical revelations. M.'s early novels, *A Munsterman's Wife* (1885), *Esther Waters*, a masterpiece of realism recounting the life of a domestic servant (1891), *Krellyn Innes* (1898), and *Sister Theresa* (1901), are an imitation of the Fr. philosophical novel, besides restoring in England the Fielding tradition and introducing an element of the realism usually associated with Zola. But if his later work, which with the chief exception of *In Single Strictness* (1922, reissued in 1927 as 'Celibate Lives'), is concerned with historical themes, he developed a form of 'prose narrative' which is entirely individual. *The Brook Kerith* (1916, revised 1927), which retells the story of Jesus, and *Heloise and Abelard* (1921) are the best examples of this. By their grandeur of conception, their wealth of incident and descriptive detail, and their melodious, highly finished style, they have established M. as one of the most accomplished literary

craftsmen of the century. Other later works are *Arrows* (1919) and *Conversations in Ebury Street* (1924), which are chiefly criticism; *A Storyteller's Holiday* (1918, revised 1928), *Ulick and Sorucha* (1926), and *Aphrodite in Autia* (1931), which are fiction; *The Coming of Gabriele* (1920), his first play, *The Making of an Immortal*, a play about Shakespeare (1927), and *The Passing of the Essenes* (1930), a play giving a new historical version of the life of Jesus. M. is unique amongst modern writers in that he revised and largely rewrote almost all his chief works. M. was entirely identified with his art and in the craft of writing; he never married. His Irish home, which remained empty for many years, was burned by the Republicans in 1923. If no real painter, at least his reactions to the fine arts made of him a champion of the Fr. Impressionist school of painting in England. See studies by Susan L. Mitchell, 1916; J. Freeman, 1922; H. Wolfe, 1931; C. Morgan, 1938; J. Hone, 1936; and his *Letters*, ed. J. Eglin, 1912.

Moore, Grace (1901-47), Amer. prima donna, b. at Jellicoe, Tennessee, educated there and at Ward Belmont School, Nashville. She studied singing under P. M. Marafote and, later, Albert Carré. Her first stage appearance was at the Colonial Theatre, Boston, in *Hitchy-Coo*, in 1920. Coming under the notice of Irving Berlin, she was engaged by him in *The Music Box Revue*. She then took further training under Miss Mary Garden in Europe, and sang in *La Bohème* in Milan, later securing a contract with the Metropolitan Opera House, New York, 1928. She made her début as an operatic vocalist at that house as Mimi in *La Bohème*, a performance which put her at once in the front rank of opera singers. She sang as Juliette in *Romeo et Juliette*, Marguerite in *Faust*, Micaela in *Carmen*, and the title rôle in *Manon Lescaut*. At the Opéra Comique she played Louise in Charpentier's opera of that name. Her début at Covent Garden as Mimi in 1935 was very successful, her reputation in London having been greatly enhanced by her brilliant film *One Night of Love*. Of her other films the best were *Love Me For Ever*, *The King steps Out*, *Interlude*, and *For You Alone*, which last-named gave her scope with the aria 'Vissi d'Arte' from *La Tosca* and Schnbert's 'Serenade.' She was killed in an aeroplane accident in Denmark.

Moore, Henry (1831-95), Eng. sea painter, b. at York, was a brother to Albert M. After painting animals and landscapes with all the loving detail of the Pre-Raphaelites, he discovered his talent for seascapes, and henceforward painted little else. His best pictures are 'The Newhaven Packet' (1878); 'Mount's Bay' (1886); and 'Hove-to for a Pilot' (1893).

Moore, Henry (b. 1898), Eng. sculptor and painter, b. & Castleford, Yorkshire, son of a coal miner. He studied at Leeds College of Art and the Royal College of Art, London, proving to be a brilliant

pupil. He first gained insight into the real nature of sculpture at the Natural Hist. Museum (chiefly in the section now transferred to the Geological Museum) and at the Brit. Museum. Here he studied the effect of natural forces on stone, wood, etc., primitive art, and particularly Egyptian, Mexican, early Gk., Etruscan, and Negro sculpture. M. held one-man shows in Eng. and various continental tns., the U.S.A., and Australia. His first commissioned work was 'North Wind,' for the underground railway headquarters in London. As official war artist 1940-1942, he produced the famous series of drawings of shelterers in the London tube stations. Other famous works include 'Madonna and Child' (St. Matthew's Church, Northampton), 'Reclining Figure' (Tate Gallery), 'Three Standing Draped Figures' (Battersea Park, London), 'Family Group' for Stevenage New Tn.

Out of widely differing influences, M. has evolved a style which in individuality and innovation of form is second only to that of Picasso. His work, which consists chiefly of stone and wood carving, makes truth to material rather than verisimilitude its first aim. It has a monumental power and a vitality of expression which has commanded the attention of a wide public and ranked M. among the most notable sculptors since Rodin. See monographs by H. Read, 1934; J. J. Sweeney (New York), 1948; and G. C. Argan (Turin), 1949; also *Henry Moore: Sculpture and Drawings*, (introduction by H. Read), 1949.

Moore, John (1729-1802). Scottish novelist, attended Glasgow Univ., and was a doctor by profession. As he was attached to the Brit. Army in Flanders in a medical capacity (1747-48), was for a time surgeon to the Eng. ambas. at Versailles, and travelled for five years (1772-77) on the Continent as tutor to the young duke of Hamilton, he had admirable opportunities for observing the social manners of his time. Carlyle availed himself of his *Journal of a Residence in France* (1793), whilst Byron formed his Childe Harold on Zeluro, a selfish Ibertine, whose name supplies the title to the most popular of M.'s novels (1789).

Moore, Sir John (1761-1809). Brit. general, b. in Glasgow, was the son of John M. (d. 1802). Entering the army as ensign in 1776, he served a long and distinguished apprenticeship to war. During the descent on Corsica he was wounded at the capture of Calvi (1794); in the W. Indies he distinguished himself at the taking of the Vigie and Morne Fortund (1796), and two years later he was engaged in quelling the Irish insurrection. In 1799, during the Dutch campaign, he was wounded at the engagement of Egmont-op-Zee, and he was again disabled at the battle of Alexandria during the expedition to Egypt (1801). At the camp at Shorncliffe in England M. evolved a system of training for light infantry, as an answer to the Fr. use of *tirailleurs*. From this nucleus developed the light div., which took a prominent part in Wellington's operations in Spain. In Oct. 1808 M.

took command of the Brit. forces in Portugal. He left Lisbon, advanced over the border, and arrived at Salamanca on Nov. 23. There he learned of Napoleon's victories over the Sp. forces at Gamonal and Tudela, near the Ebro, and, fearing attack by greatly superior forces, determined to withdraw. On Dec. 3, however, he learned that Napoleon was moving southward to Madrid and not westward against the Brit. forces, and seized the opportunity to strike at Napoleon's line of communication in Old Castile, distract his attention, and give the Spaniards a breathing space. M. knew the dangers he faced, and knew that a rapid retreat to Corunna would be inevitable as soon as Napoleon turned northwards in answer to the threat to his rear. M. hoped to fall upon an isolated Fr. body under Soult, but on the 23rd received the expected news of Napoleon's advance against him, and immediately turned for Corunna. The pursuit was pressed through the wilderness of Galicia, with great suffering to the Brit. troops, and a noticeable deterioration in discipline, for both of which M.'s refusal to stand and fight, though probably correct, was largely responsible. Arriving at Corunna M. found the transports delayed, and turned to give battle. At the height of the action on Jan. 11, 1809, M. was killed. Whatever errors of detail were committed, the campaign as a whole was a sound strategic concept, disrupting Napoleon's plans, and giving a much-needed respite to the hard-pressed Spaniards. See lives by J. C. Moore, 1831, and J. F. Maurice, 1837. Also *Diary*, ed. by J. F. Maurice, 1904; C. W. C. Oman, *History of the Peninsular War*, 1902-11; and J. F. C. Fuller, *Sir John Moore's System of Training*, 1794-1823, 1925.

Moore, Mary (Lady Wyndham) (1801-1931). Eng. actress, b. in London. After the death of her first husband, James Albany, she married Sir Charles Wyndham, 1916. Her association with the latter began in 1885; she acted in numerous plays with him, and became a partner with him in the proprietorship of the Criterion, Wyndham's, and the New Theatres. Her earliest big success was as Ada Ingot in *Dand Garrick*. Many of her later roles were in the plays of Henry Arthur Jones and Hubert Henry Davies.

Moore, Thomas (1779-1852). Irish poet, satirist, and biographer, b. in Dublin, May 28. His father was a grocer, who later became a quartermaster in the army. He may be regarded as the national poet of Ireland. An Act of Parliament having opened Dublin Univ. to Rom. Catholics, he went there in 1793. He began to write poetry, and in 1799 was permitted to dedicate a metrical trans. of *Anacreon* to the Prince of Wales. In his nineteenth year he came to London to keep his terms as a law student of the Middle Temple. In 1803 he was given the appointment of Admiralty registrar at Bermuda, the work of which was done by a deputy. In 1801 appeared his *Poems by the late Thomas Little*, and six years later began to appear

his *Irish Melodies*, with music by Sir John Stevenson. In another branch of letters M. was also to make a great success, and he showed himself a master of the airiest satire in *Intercepted Letters; or Two-penny Post-bag* (1813) (written under the name of Thomas Brown the Younger), in which he lampooned the regent and his associates. One of the most popular books of the day was his E. poem *Lalla Rookh* (1817), for which he received £3000 from Messrs. Longman's. He now removed to the residence in which he died, a rural home beautifully situated near the woods of his patron, Lord Lansdowne, but, owing to the default of his Bermudan deputy in the sum of £6000, most of what he earned went to the payment of this debt. In the following year appeared the amusing *Fudge Family Abroad*, written in the vein of *The Two-penny Post-bag*. Turning to prose he reverted to his long-meditated *Life of Sheridan*, which was issued in a quarto vol. in 1825; but the life did not come up to expectation. Byron had entrusted M. with his *Memoirs*, but when Byron died in 1824 M. destroyed the *Memoirs*, and wrote an excellent biography of his friend (1830), which ranks among his best work. He also wrote a biography of Lord Edward Fitzgerald, and in 1834 pub. *Travels of an Irish Gentleman in search of a Religion*. M.'s *Memoirs, Journals, and Correspondence* was edited by Earl Russell (1853-56). There is a monograph by Stephen Gwynn in the Eng. Men of Letters series (1905).

Moore, Thomas Sturge (1870-1944). Eng. poet and wood engraver, b. at Hastings. Member of the Academic Committee of the Royal Society of Literature. His writings include, Poetry: *The Linneidresser and other Poems* (1899); *Aphrodite and Artemis* (1901); *Absalom* (1903); *The Little School* (1905, enlarged 1917); *The Sicilian Idyll and Judith* (1911); *Tragic Mothers* (1920); *The Powers of the Air* (1920); and *The Unknown Known*, . (1939). Prose: *Correggio* (1906); *Art and Life* (1910); *Some Soldier Poets* (1919); *Why Beautiful?* (1920); *Armour for Aphrodite* (1929); and *Mystery and Tragedy*, two dramatic poems (1930).

Moorea, see EIMEO.

Moorhead, city and co. seat of Clay co., Minnesota, U.S.A., 212 m. N.W. of Minneapolis. It is the centre of an agric. region, has flour mills and machine shops, and manuf. bricks. Pop. 9400.

Moorhen, see WATERHEN.

Moorish Architecture, see ARCHITECTURE, Mohammedan.

Moor Park, Hertfordshire, near Rickmansworth, on the Metropolitan Railway. The house, built about 1670, was the seat of Lord Ebury, who sold it for building land after the First World War. Here is Northwood, where the Merchant Taylors' School was moved from Charterhouse Square in 1933. There is another M. P. on the Wye, 2 m. from Farnham, Surrey. It was the residence of Sir William Temple and here Swift first met 'Stella' (Esther Johnson), and wrote *The Tale of a Tub* and *The Battle of the Books*.

Moors (Lat. *Mauri*, meaning dark; Sp. *Moros*) are a people who form the great majority of the pop. of Barbary, and gave their name to Morocco. Their appearance indicates their origin, which is a mixture of the Mauri (from which they derive their name), Numidians, Phoenicians, Romans, and Arabs, who have successively held possession of the country. In consequence they are found to vary considerably in appearance and character in different parts of Barbary, but all show more or less strongly the symptoms of a considerable infusion of Arabian blood. They were, after a severe struggle, conquered and converted by the Arabs in 707. The M. in Spain were a composite African race, who, invited by the Church party to assist in the suppression of the Visigothic aristocracy, invaded the whole peninsula (710), and became the dominant power until the eleventh century. Cordova was the great centre of the Saracen dominion after 755, when its univ., famous in Rom. days, revived. These Arab invaders, though luxurious in their mode of life, were a highly cultivated race, and in the study of mathematics, science, and philosophy, eclipsed all the European races. Through the M. the culture and civilisation of the ancients were chiefly preserved, and were transmitted to the modern world. The race widely intermarried with the natives of Spain. The Christian victories of the eleventh century in Spain seemed at one time likely to annihilate the Moslem power in that country. From this fate, however, it was saved not by internal strength, but by the arrival of help from Yusuf, king of the Almoravids of N. Africa. Yusuf eventually made himself master of Andalusia, and in the course of a few years the whole of Moslem Spain became reunited under the king of Morocco, and the death of the Cld (q.v.) in 1099 enabled the M. to recover Valencia, which he had taken in 1094. After the fall of the Almohades the triumphs of the Christian arms were rapid and decisive, and in 1238 the M. retired to Granada, where they formed their kingdom, which was trib. to Castile. The subsequent hist. of the M. cannot be separated from that of Algiers, Tunis, and Morocco. See ALGIERS; TUNIS; SPAIN; MOROCCO.

Mooruk, see CASSOWARY.

Moose, see ELK.

Moose Jaw, tn. in the prov. of Saskatchewan, Canada, about 50 m. W. of Regina. It is a mkrk. tn. in the middle of the wheat belt, and has co-operative stock yards. M. J. derives its name from a great pile of bones of moose which were formerly near the tn. Pop. 22,600.

Mopihia Island, see under LORD HOWE ISLAND.

Moplas, or Mapillas, race of fanatical Muslims, found along the Malabar coast in S. India. It is thought that they are sprung from a body of Arab merchants who came to India in the third century after the Hegira. The M. to-day number about 1,000,000.

Mopsus, in Gk. legend (1) a celebrated soothsayer, son of Apollo and Manto, the daughter of Tiresias. He contended in

prophecy with Calchas at Colophon, and showed himself superior to the latter. He was believed to have founded Mallos, in Cilicia, in conjunction with the seer, Amphilocus. A dispute arose between them over the possession of the tn., and both fell in combat by each other's hand. (2) One of the Lapithae, son of Ampyx and the nymph Chloris, and the prophet and soothsayer of the Argonauts. He is said to have died in Libya of a snake-bite.

Moquegua, coast prov. of S. Peru, with an area of 5550 sq. m. The cap., M., is 20 m. from the Chilian frontier, and 85 m. S.E. of Mollendo. The tn. is the terminus of the railway from Ilo (60 m.). The chief products are wines, olives, cotton, oil, copper, and lead. The tn. suffered severely from earthquakes in 1715 and 1868. Pop. (prov.) 34,000; (tn.) 4000.

Mora: 1. Com. and tn. of Spain in the prov. of Toledo, 18 m. S.E. of the city of Toledo. Pop. 10,000. 2. Com. and vil. of Sweden in the prov. of Kopparberg, on the R. Oster Dal, 45 m. N.W. of Falun. Pop. 9500.

Moracea, fleshy fruit, the stems of which are filled with a milky juice. To the same family belong hops, mulberries, tigs, rubber trees, the Indian banyan, bread-fruit, and the W. African timber known as *iroko* or African teak.

Moradabad, or **Muradabad**, dist. and municipal tn. of the United Provs., India, 50 m. N.W. of Bareilly. The dist. covers an area of 2282 sq. m., and wheat, rice, and cotton are grown. Other tns.: Aniraha, Sambhal, and Chaudausi. Pop. 1,200,000. See also **BAREILLY**.

Moraine Garden, modern development in horticulture. It solves the problem of the successful cultivation of a number of Alpine plants, some of which could not previously be grown away from their native M. There the conditions of plant growth are continuous root moisture in summer from the melting of ice and snow, and complete dryness and protection by the snow against frost at other times. These conditions are reproduced by excavating a hole in a sunny mound or bank, about 2 ft. deep, and of any extent, great or small. After providing perfect drainage the hole is filled with small sandstone chips mixed with a little leaf soil, and the plants are introduced with great care. Water can either trickle through or be poured in daily, and the stones retain moisture in the hottest weather. In the autumn the water supply is stopped, and later the M. is drained dry. The names of suitable plants may be found in plant dealers' catalogues.

Moraines, see under **GLACIER**.

Morales, Luis (d. 1586), Sp. painter, b. at Badajoz, surnamed 'El Divino' because he confined himself to sacred subjects. In 1581 Philip II. found him in poverty at Badajoz, and prosecuted him with an ann. pension of 300 ducats, a tardy recompense for a former unceremonious dismissal. Despite the detractions of his critics, he deserves remembrance for his consummate skill in expressing Christian suffering and grief,

notably in his chief works 'Ecce Homo' and 'Mater Dolorosa' in the Prado, Madrid. See life by Berjano Escobar, 1921.

Morality, Fr. term commonly used to describe the plays always known in England as moral plays or moral interludes. These plays, though developed out of the miracle plays (q.v.), are still more closely related to a Lat. origin. Their real source is Prudentius (c. 400), who in his *Psychomachia* had the same subject as did all the moralities, namely, 'personified abstractions fighting for the human soul.' A brief outline of one of the earliest extant moralities, *The Castle of Perseverence* (c. 1450), will give some idea of the *dramatis personae*. It tells the hist. of Humanum Genus tempted by Luxuria. When about to be lost entirely he is saved by Poenitentia, who brings him to the castle of Perseverence. Here he remains until his old age, when he is tempted by Avarice. Then follows a swift descent towards Hell, whence he is saved by Pity and Mercy. For *Everyman*, the most famous of the moralities, see *Everyman and Other Interludes*, ed. by E. Rhys in Everyman's Library. The latest development of the M. was to make it convey some special lesson, theological or educational. In Bale's *King Johan* it became the medium of hist., and hence led to the historical drama.

Moral Philosophy, see **ETHICS**.

Moral Theology, the 'science of human acts considered in the light of man's supernatural destiny; consequently not only reason, but also the light of faith is employed in establishing and applying the principles of the science' (Attwater). M. T. is distinguished from moral philosophy or ethics, which is concerned with the principles of right and wrong, and their application so far only as they can be known by the light of reason; whereas M. T. measures the moral character of actions by their conformity, not only with ethical standards, but also with the Christian revelation and positive law of the church. Again it differs from dogmatic theology in that it is not concerned with speculative truth, but the moral obligations arising from faith and with the truths of faith as principles of conduct. A clearer if less scientific idea of M. T. may be given by defining it as 'the science of priests sitting in the confessional, or the science which enables them to distinguish right from wrong, mortal sin from venial sin, counsels of perfection from strict obligations, and so to administer the sacrament of penance.' The literature of M. T. had its rise in the Middle Ages, but the more familiar works are those of writers of the fifteenth century, such as Jean Charlier de Gerson (1363-1429), the famous chancellor of the univ. of Paris, whose *Opusculum tripartitum de preceptis, de confessione, de arte moriendo* acquired so great a repute that a score of synods enjoined its use in expounding the Decalogue, hearing confessions, and visiting the sick. Also may be mentioned the *Summa theologiae* and *Summa confessionis* of St. Antoninus (1389-1459), bishop

of Florence and church historian. A true conception of M. T. is, however, not to be acquired merely from an account of works exclusively devoted to the science; for the greatest moral theologian of the Middle Ages was St. Thomas Aquinas, who treats M. T. as an organic part of dogmatic theology from which he does not separate it as have many since his age, deeming this the true scientific method. From the time of Medina (1528-81), a sp. Dominican and prof. of Salamanca, theories affecting the whole system of M. T. arose and divided moral theologians into schools—probabilist, laxist, probabiliorist, rigorist, tutorist—sharply separated and often bitterly hostile to each other. It was Medina who propounded in his *Exposition of St. Thomas* the theory since known as ‘probabilism,’ and thereby started a controversy which raged for 200 years after his death. Probabilism, as formulated by Gury (*Compendium Theologiae Moralis*, 1853), is the doctrine that, in matters of conscience, ‘of two opinions it is lawful to follow the less probable, provided that this opinion rests on solid grounds.’ The doctrine flourished until about 1650, and then a reaction set in in favour of ‘probabiliorism’—the doctrine that a law is always to be obeyed unless an opinion clearly more probable (*probabilitas*) is opposed to it. A formidable attack on the M. T. of the Jesuits, which (*inter alia*) embraced probabilism, was made by Pascal in his classic work, the *Provincial Letters* (1656-1657). In his two works, *Theologia Moralis et Homo Apostolicus*, St. Alfonso Liguori (1696-1787) (*a.r.*) revived probabilism, which then became the ordinary rule of confessors in the Rom. church. The literature of M. T. may be said to have at length attained its definite form in the above two works of Liguori, which were pub. about the middle of the eighteenth century; for nearly all the works on the subject since then have been influenced by his teachings. In the first of these works Liguori (in his own words) ‘selects from a mass of opinions those decisions which, on the one hand, should uphold the obedience due to the precepts of God and of the church, and on the other should not add burdens which God has not imposed, by binding every one to that perfection which, through human weakness, is morally impossible to the general body of believers.’ The second work was intended for the guidance of priests in hearing confession.

Casuistry is defined ‘as the reasoned application of law to concrete cases; it determines with all possible exactitude the limitations of law or the bearings of law in particular cases’ (Davis). A casuist is therefore like a lawyer working on a given case in the light of the principles of his science. See W. Addis and T. Arnold, *Catholic Dictionary*, 1917; T. Slater, *Manual of Moral Theology* (2 vols.), 1925; H. Davis, *Moral and Pastoral Theology*, 1934; and H. R. McAdoo, *The Structure of Caroline Moral Theology*, 1949.

Moral Welfare, see PROSTITUTION; VIGILANCE SOCIETIES. As to the moral

welfare of children and young persons see CHILDREN ACTS, 1908, 1933; CHILD WELFARE AND LABOUR; see also BORSTAL SYSTEM; JUVENILE OFFENDER. On the probation system see also under CRIMINAL LAW.

Morand, Paul (b. 1888), Fr. diplomat, poet, and novelist, b. in Paris. He was attaché at the Fr. Foreign Office and then secretary to embassies in various parts of the world. In 1944 he became ambas. at Berne. He began in literature as one of the most determined exponents of modernity. His poems in free verse had affinities with the Dadaists. His books of short stories, *Ouvert la nuit* (1922) and *Fermé la nuit* (1923), dealt with various parts of the world seen through the lives of women. *Lewis and Irene* (1924) grew out of memories of Oxford. His chronicle of the twentieth century, *L'Europe galante* (1926), is a daring series of stories about women, in his earlier manner. *Boudha vibrant* (1927) attempts to probe the soul of Asia. *Magie noire* (1928) deals with black folk all over the world. *Champions du monde* (1930) is a fantastic story of Amer. life. Other works are *Green Shoots* (1922, New York, 1930); *Frenchman's London* (1933); *Flèche d'orient* (1934); *The Epic-makers* (1935); *Rond-Point des Champs Elysées* (1935); *Les Extravagants* (1937); and *Isabeau, de Barrière* (1938). See A. Rousseaux, *Mes et roisages du XXe siècle*, 1932.

Morant, Sir Robert Laurie (1863-1920). Brit. educationist; son of Robert M., Hampstead. He was educated at Winchester and New College, Oxford. He was appointed tutor to the Siamese royal family. On his return to England he engaged in social and education work in E. London. In 1895 he became assistant director of special inquiries and reports in the education dept. He was acting secretary to the Board of Education, 1902, and permanent secretary, 1903. He was made K.C.B., 1907. From 1912 to 1919 he was chairman of National Insurance Commission. M. was one of the most distinguished administrative officials in the hist. of the Brit. civil service. See also FISHER, SIR WARREN. See R. W. Harris, *Not So Humdrum*, 1939, on M.'s part in the work of the Insurance Commission.

Morar: 1. Dist. and loch of W. Inverness-shire, Scotland. The loch, 12 m. long, is noted as being the deepest in the Brit. Isles, its maximum depth being 1017 ft. 2. Tn. of central India in the state of Gwalior, and 3 m. from that city. Pop. 31,000.

Morat, or Murten, anc. tn. of W. Switzerland, with picturesque avenues of laurel, and a Gothic castle of the thirteenth century and city wall and towers of the same period. Manus, electrical apparatus and cooking-stoves. Pop. 2400.

Morata, Olympia Fulvia (1526-55). It. scholar and poet, b. at Ferrara, daughter of a distinguished prof., Fulvio Pellegrino M. She lectured in public at an early age, and upon the death of her father took up teaching to maintain the family. About 1550 she married a Ger. physician,

Andreas Grundler, but they were unsettled, and she suffered much by the siege of Schweinfurt. She d. at Heidelberg, leaving many Lat. and Gk. poems, a commentary on Homer, etc.

Moratin, Leandro Fernández de (1760-1828), Sp. poet and dramatist, b. at Madrid, was the son of a poet. On the recommendation of Jovellanos he became secretary in 1787 to the Sp. embassy in Paris, and after travelling in Europe at public expense to study the contemporary stage, received, through the kindness of Don Manuel Godoy, the post of official translator to the Foreign Office. The arrival of Napoleon in Spain brought misfortune and exile to M. as to others. Of his five comedies the best are *La Comedia nueva*, *El Café* (New Play, 1792), a satire on the extravagant dramas of the day; *El Si de las Niñas* (Little Girls Consent, 1806); and the satire *La Mojigata* (The Female Hypocrite, 1804), an imitation of Molière's *Tartuffe*. In 1812 was produced *Escuela de los maridos*, a trans. and adaptation of Molière's *École des maris*, and in 1814 *El Médico a Palos* (from *Le Médecin malgré lui*). His complete works were ed. by Ruiz Morcuende in *Clásicos castellanos* (1924).

Moravia (Ger. Mähren), prov. of Czechoslovakia, formerly a margravate and crownland of Austria. It is situated to the E. of Bohemia. After the First World War it was linked with W. Silesia, the total area of the political div. being 10,324 sq m. It is watered by the March, a trib. of the Danube, which flows through the country from N. to S. Along its N. boundary run the Sudetic Mts.; on the W. are the Bohemian highlands, on the E. the Carpathians and White Mts. The country is principally engaged in agriculture, though there are rich mineral deposits of iron, lignite, coal, etc. Cereals of all kinds are extensively produced, and there is some woollen manuf. In March 1939 Hitler declared that Czechoslovakia had ceased to exist and that the ter. of Bohemia and M. formed a protectorate of the Reich. It was liberated by the Allies between Oct. 1944 and May 1945, when the Axis-created protectorate of Bohemia and M. ceased to exist (May 9, 1945), following an armed rising staged by the Czech National Council in Prague. Pop. of M. and W. Silesia, 3,565,000. For hist., etc., see articles on AUSTRIA; BOHEMIA; CZECHOSLOVAKIA; also EASTERN FRONT IN SECOND WORLD WAR; WESTERN FRONT IN SECOND WORLD WAR.

Moravians, known also as the Moravian Brethren, the Bohemian Brethren, or the Unity of the Brethren (*Unitas Fratrum*), small Protestant body who somewhat doubtfully trace their origin to the fifteenth century. In the middle of that century a section of the sect known as Taborites gathered round the Calixtine bishop of Prague, and formally constituted themselves a sect in 1467. At the time of the Reformation they had friendly intercourse with Luther, though their sympathies were, on the whole, more with the reformed churches. At this time there

were some 400 churches in the sect. During the persecutions of the sixteenth century many of the brethren fled to Poland, where they were gradually absorbed in other Protestant bodies. In the first quarter of the seventeenth century the Bohemians and M. being implicated in the revolution which came to an untimely end in 1620, were almost completely exterminated. No more is heard of them until the beginning of the next century. Then under the leadership of Christian David, a carpenter, certain M. emigrated to Saxony, where they were well received by Count Zinzendorf (1700-1760), who then became their leader. Here they lived at first as ordinary Lutherans, but later erected a church of their own. They lived a strict life, with daily prayers, a community of interests and strict exclusiveness. They still retained the form of the episcopate. Branches have now been estab. in other parts, and the unity has now four provs.: Ger., Brit., N. Amer., and S. Amer., each prov. managing its own affairs. Once in ten years a general synod meets, representing all the provs. The Moravian Church has always been characterised by its missionary vigour. See hists. of the brethren by A. Gindely (1856-57); L. Groll (1878-85); A. C. Thompson (1883); E. de Schweinitz (1885); J. T. Hamilton (1900), and J. Müller (1922-30). See also B. T. Jenkins, *Moravian Brethren in North Wales*, 1938.

Moray, Earl of, see RANDOLPH, THOMAS. **Moray, or Murray, James Stuart**, first Earl of (c. 1531-70), regent of Scotland, was the natural son of James V. of Scotland by Lady Margaret Erskine, daughter of the fourth earl of Mar. On hearing John Knox at Calder, he joined the lords of the congregation (1559) in opposition to the queen regent's party. In 1561 he escorted his half-sister, Queen Mary, from Paris to Scotland, and became her chief adviser. He was created earl of M. in 1564, but lost the queen's favour when he showed his disapproval of her marriage with Darnley (1565). After the murder of Rizzio he was restored to favour, but made his escape to France at the time of Darnley's assassination and Mary's marriage to Bothwell. After the abdication of Mary at Lochleven, he was summoned to Scotland to take up the duties of regent, and after her escape defeated the queen's forces at Langside in 1568. He came to England to bring accusations against Mary at her trial. He was murdered at Linlithgow, and was buried in St. Giles' Cathedral, Edinburgh.

Moray (fish). see MURANA.

Moray (formerly Elgin), N. Scottish co., fronting the M. Firth and lying between Banff and Nairn; mountainous in the S., but flat in the N., and watered by the Spey, Lossie, and Findhorn. The chief industries are agriculture, stone-quarrying, distilling, and fishing. It has some imposing ruins and interesting antiquities. Area 305,000 ac. Pop. 43,600.

Moray Firth, arm of the North Sea. It is about 18 m. across the entrance, from

Tarbat Ness to Burghhead, and about 30 m. long from there to the entry to the Caledonian Canal. The Spey and the Deveron are the chief rvs. draining into the firth.

Morbihan, dept. of W. France, named after the gulf of M. (Inner Sea), formed in 1790 from part of Lower Brittany. The Atlantic coastline has many inlets. The Vilaine and the Blavet, into which flow the Auray and the Scorff, are both canalised, whilst the Oust forms part of the waterway from Nantes to Brest. The highest land (975 ft.) is in the Montagnes Noires of the N. Barren heath covers a quarter of the prov., whilst a third part produces good crops of wheat, rye, buckwheat, and mangels. The fisheries and oyster culture are important. Vannes is the cap.; Lorient is a shipbuilding centre. These tns., together with Pontivy, give their names to the three arrons. M. is noted for its prehistoric remains, especially megaliths. Area 2738 sq. m. Pop. 506,884.

Morcar, Saxon earl, grandson of Leofric and brother of Edwin, earl of Mercia. He helped the Northumbrians to expel their Earl Tostig, whose conduct had made him unpopular, and was then elected in the place of Tostig. Harold, earl of Wessex, agreed to this election, but later was deserted by M. and F. Edwin, and left to fight alone first with Tostig and the king of Norway at Stamford Bridge, then with William of Normandy at Hastings. Subsequently M., having failed to raise the country against William the Conqueror, fled to Ely to join Hereward the Wake, but was captured and d. in prison. See F. M. Stenton, *Anglo-Saxon England*, 1947.

Mordants, see under DYES AND DYING.
Mordaunt, Charles, see PETERBOROUGH AND MONMOUTH, EARL OF.

Mordecai, Jewish Benjaminite exile in Persia, who figures in the O.T. book of Esther as the queen's cousin and foster-father. With the elevation of his cousin, the Jewish maiden, Hadassah, as queen under the new name of Esther, M. became an official of the Persian court and thus learned of a conspiracy against the king, Ahasuerus, which he frustrated. When the king raised Haman to be vizier, M. refused to do him reverence, apparently because he believed it to be the duty of every Jew to show enmity to Amalek, and Haman then determined not only to destroy M. but the whole Jewish race. The service that M. had rendered the king induced the latter to call upon Haman to show honour to M. After the deliverance of the Jews was secured, through the intervention of Esther, M. became vizier instead of Haman.

Mordvinian Republic, autonomous republic of the R.S.F.S.R., lying about 250 m. W. of the R. Volga, with the Moscow Region to the W., the Gorky Region to the N., and the Kuibishev Region to the S. and E. The people are of Finnish origin (see MORDVINS), and the area is chiefly given over to agriculture. Cap. Saransk. Pop. 1,189,000.

Mordvins, people of Finnish origin, inhabiting E. Russia. Until the middle of the eighteenth century they were virtually

pagans, but later became largely intermingled with the Russians, and now comprise two main divs., viz. the Moksha and the Erzya. They are of medium height, with fair skins, blue eyes, and generally oval faces. They number about 800,000.

More, Sir Anthony, see MORO, ANTONIO.

More, Hannah (1745-1833), Eng. authoress, b. at Stapleton, Gloucestershire. She came to London in 1774, and made the acquaintance of Dr. Johnson, whom she flattered unduly, of Burke, and the leaders of the "blue-stocking" coterie. Garrick produced her play, *Percy* (1778), an artificial and introspective play which finds an outlet for emotional intensity in tragic action. After the death of Garrick, however, she came to the conclusion that play-going was immoral, and she henceforth led a retired life. She consorted chiefly with the clergy and philanthropists, started Sunday schools in Cheshire, and organised a movement that led to the formation of the Religious Tract Society (1799). She wrote *Cælebs in Search of a Wife* (1808) and a tract, *The Shepherd of Salisbury Plain* (1820?), and also many other religious works. She left her fortune to charities and religious institutions. See Lives by W. Roberts, 1838, and H. Thompson, 1838; and M. A. Hopkins, *Hannah More and her Circle*, 1947.

More, Henry (1614-87), Eng. philosopher, b. at Grantham, Lincolnshire. At Christ's College, Cambridge, from which he took his M.A. degree in 1639, he lost himself in the delights of philosophical, and especially Platonic, studies. His *Divine Dialogues* (1668) ("containing Disquisitions and Instructions concerning the Attributes of God and the Providence in the World"), *Philosophical Poems* (1617), and *Enchiridion Metaphysicum* (1673) are all penetrated with Neoplatonic mysticism and spiritualistic fantasies, which he owed in part, it seems, to his intimacy with Lady Conway, the Quaker. M. represents more than any other member of the school the mystical and theosophic side of the Cambridge movement. The *Divine Dialogues* is his best known work, the most authentic ed. appearing in 1713.

More, Paul Elmer (b. 1864), Amer. author and editor, b. at St. Louis. He was educated at Washington Univ. and at Harvard, where he was assistant for Sanskrit from 1894 to 1895. He was associate for Sanskrit and classical literature at Harvard and Bryn Mawr College, 1895-97. He lectured on Plato at Princeton Univ. and was literary editor of the *Independent* (1901-3) and of the *New York Evening Post* (1903-9), and editor of the *Nation* (1909-14). His pubs. include *Sherburne Essays* (1904); *Life of Benjamin Franklin* (1908); *Platonism* (1917 and 1927); *The Religion of Plato* (1921); *Hellenistic Philosophers* (1923); *The Demon of the Absolute* (1928); and *The Skeptical Approach to Religion* (1934).

More, Sir (Saint) Thomas (1478-1535), an Eng. lawyer and statesman, b. in Milk Street, London. He received the

rudiments of education at St. Anthony's School, Threadneedle Street, at that time held to be the best in the city. He was early placed in the household of Cardinal Morton, archbishop of Canterbury, a high privilege which he owed to the influence of his father, Sir Thomas M., who was later a justice of the court of king's bench. M. soon made a name for himself as a lawyer. He entered Parliament in 1504, first attracting public notice by his bold opposition to King Henry VII.'s demand for a grant on the occasion of his



SIR THOMAS MORE

Engraving after an enamel by Holbein.

daughter's marriage. The king was entitled, by feudal law, to a grant, but he had come to the Commons to ask for a much larger sum than he proposed to give as dowry. On M.'s intervention the Commons much reduced the subsidy. Henry never forgave M.'s audacity, but the only revenge he could take for the moment was to throw Sir Thomas M. into the Tower, whence he was released on payment of a fine, while the son discreetly withdrew for some time from public life. The death of Henry VII., however, restored him to the practice of the law and to his public career (1508). There was no cause of importance in which he was not engaged, and he soon attracted the attention of the young king and Wolsey. In Parliament he frequently opposed the Crown. In the Star Chamber he obtained judgment against the Crown in a case of the Crown v. the Pope. Instead of resenting this defeat, however, the king promptly took M. into his service. In 1514 M. was appointed master of requests and made a privy councillor. He was often sent on embassies to the Low Countries. While on a mission to Flanders

he began to write his most famous work, *Utopia*, which was first pub. in Lat., 1516. It had immediate popularity and was trans. into Ger. 1524, Fr. 1530, It. 1548, Eng. 1551, and Sp. 1790. (See ed. with Roper's life, and some letters, by W. G. Sampson, 1911.) It gives an account of an imaginary is. and people, under cover of which it describes the social and political condition of England, with remedies for abuses. The opinions on religion and politics are not, however, always those by which he was himself guided, as will be seen later. In 1519 he was compelled to give up his private practice at the Bar; he accompanied the king to the Field of the Cloth of Gold in 1520, and in 1521 he was knighted and made treasurer of the exchequer. In the Parliament of 1523 he was elected Speaker, being in effect put into that office by the court in order to make use of his popularity in the Commons to carry the money grant which Wolsey required. But to the chagrin of the court M. espoused the popular cause, and owing to his influence Wolsey's demand was resisted, and from that moment the cardinal's jealousy of M. had its beginnings. Wolsey tried to get him out of the way by sending him as ambas. to Spain, but the king, who was already on the look out for a successor to Wolsey, thwarted the latter's design. He appointed M. chancellor of the duchy of Lancaster (1525), and indeed embarrassed him by constantly seeking his company either at the palace or at M.'s house at Chelsea. In 1529 M. succeeded Wolsey as lord chancellor of England, in which capacity he showed great ability. He was, however, too conscientious for the comfort of the monarch. In his *Utopia* (1516) M. had declared for tolerance of religious creed with a liberality of philosophical detachment to which there is no parallel in any Englishman of that period. But at the same time he was not in sympathy with Lutheran heretics and opposed a Bill designed to relax the severity of the heresy laws. Above all, the royal divorce was a matter on which he absolutely refused to give way, and when he realised that the marriage with Anne Boleyn was settled he petitioned the king to be allowed to resign the great seal, alleging indifferent health. The resignation was reluctantly accepted. For a while M. lived in retirement, devoting his energies to a controversy on religious subjects with Tyndale and others. But he was too conspicuous a figure to be allowed long to enjoy the happiness of a retired life. He was summoned by the king to attend the coronation of Anne Boleyn, but declined, and from that moment he was marked out for vengeance. In 1534, when the Act of Supremacy was passed, matters came to a head with his hostility to any action of the king against the pope's authority and he was committed to the Tower. Refusing to take the oath of supremacy, after much attempted negotiation, he was indicted for high treason in Westminster Hall, found guilty, and sentenced to be hanged, drawn, and

quartered. The sentence was eventually commuted to decapitation. At the block he protested that he *d.* for his religious opinions. A patron of art, an excellent writer, a sound lawyer, and a capable statesman, he was a great loss to his country. He was canonised in 1935. Among his works, apart from *Utopia*, are a life of Picus, earl of Mirandula (1510), and a *History of Richard III*, written about 1513. He wrote many controversial works, among which is *Dyaloge concerning Hercules* (1529), also epigrams and dialogues in Lat. His pure and religious character, his constancy and fortitude under misfortune, combine to make him one of the most attractive and admirable figures in Eng. hist.

M.'s early ideas of clerical celibacy were dispelled after he had become acquainted with the family of John Colt of New Hall, Essex; for the 'honest and sweet conversation' of the daughters attracted him and he married the eldest. Erasmus has left a picture of his happy life in his Chelsea home—'a modest yet commodious mansion. There he lives surrounded by his numerous family, including his wife, his son, and his son's wife, his three daughters and their husbands, with eleven grandchildren. There is not any man living so affectionate to his children as he, and he loveth his old wife as if she were a girl of fifteen.' After the execution of M., the vindictive king expelled Lady M. from the Chelsea house and set aside the assignments which had been validly executed by M., and settled his property on Princess Elizabeth. M.'s eldest daughter, Margaret, married to his biographer, W. Roper, was remarkable for her wide accomplishments—Lat. and Gr., music, and the sciences so far as they were accessible and also for her great devotion to her father. See Lives by R. W. Chambers, 1938, 1949; D. Sargent, 1936, and A. Cecil, 1937; and Elizabeth F. Rogers (ed.), *The Correspondence of Sir Thomas More*, 1947.

Möre, co. of Norway, lying between the Dounefield and the Atlantic. It has a long coastline with many fjords. The prin. industry is fishing. The chief tns. are Kristiansund, Aalesund, and Molde. Area 5811 sq. m. Pop. 181,089.

Morea (riv.), see ERTROS.

Morea (the ancet. *Peloponnesus*, the is. of Pelops), peninsula forming the S. part of Greece (q.v.), connected with Central Greece by the isthmus of Corinth. The surface is mountainous. Area 8288 sq. m. Patras is the chief port.

Moréas, Jean (1856-1910), Fr. poet and novelist, b. at Athens. His real name was Joannis Papadimitriopoulos. His acquaintanceship with Verlaine inclined him in such earlier work as *Pèlerin passionné* (1891) to the symbolist as opposed to the realistic school; but, believing the former to have no enduring literary quality, he became the founder and leader of the 'Ecole Romane,' whose ambition it was to rival the Pléiade (q.v. and RONSARD), and turned to the old medieval-romantic style, producing in that vein his *Contes de la vieille France* (1903). But his best

work is a reversion to the classical precision of Malesherbes and Corneille, and includes *Iphigénie* (1903) and *Les Stances* (1905). See E. Raynaud, *La Méle symboliste*, 1920, and study by R. Niklaus. 1936.

Moreau, Gustave (1826-98), Fr. painter, b. in Paris. On four occasions he won prize medals at the Salon, where he regularly exhibited. At his death he left 8000 pictures, water-colours, and drawings to the nation, this fine collection being housed in the Moreau Gallery, Paris. In his early pictures, such as a 'Pietà' (1852) and the 'Death of Darius,' he expresses his indebtedness to Chassériau. One of his finest paintings was 'The Young Man and Death' (1866). His subjects were chiefly taken from classical or religious story; among his best known works are the 'Atheneans with the Minotaur' (1855); 'Edipus and the Sphinx' (1864); 'Galatæ' (1880); and 'Moses on the Nile' (1878). See study by L. Bénédite, 1922.

Moreau, Hégrisse (1810-38), Fr. poet, whose sad death in a hospital heightened interest in a posthumously pub. collection of his poems entitled *Le Myosotis* (1830). His range is somewhat restricted, but his verse is always inspired by a genuine passion. Some of his best pieces, such as the elegy *La Voulzie*, are to be found in standard anthologies.

Moreau, Jean Victor (1761-1813), Fr. general, b. at Morlaix, in Brittany. He took the side of the revolution, and in 1794 he was made a general of a div. When Pichegru fell under suspicion the Directory appointed M. in 1796, to the chief command on the Rhine and Moselle. He defeated Latour at Rastadt and the Archduke Charles at Ettlingen, and drove the Austrians back to the Danube, though the final victory was gained by the archduke, in brilliant manoeuvring which compelled a Fr. retreat to the Rhine. A suspicion of participation in the plots of Pichegru led to his being deprived of his command after the *coup d'état* of 18th Fructidor. In the following year he succeeded Schérer in the command of the army in Italy. By a retreat conducted with consummate skill he saved the Fr. army from destruction. The Directory, nevertheless, deprived him of the chief command, and gave it to Joubert. But M. remained with the army, and aided that young general; and after his death again assumed the command, and conducted the defeated troops to France. The noble disinterestedness of M.'s character, his military talent, and his political moderation induced the party which overthrew the Directory to offer him the dictatorship of France, which he declined, and lent his assistance to Bonaparte on 18th Brumaire. M. gained victory after victory over the Austrians in the campaign of 1800, and won the battle of Hohenlinden. A strong feeling of mutual distrust now arose between M. and Bonaparte. The latter surrounded him with spies, and he was accused of participation in the plot of Cadoudal and Pichegru against the life of the first consul. He was arrested, sentenced to two years'

imprisonment, which was commuted into banishment, and went to America. He however, landed at Gothenburg (1813), and accompanied the emperor of Russia and the king of Prussia in the march against Dresden, where a Fr. cannon-ball broke both his legs, and he d. soon afterwards.

Morecambe, municipal bor. and watering-place of N.W. Lancashire, England, on M. Bay, 3½ m. W.N.W. of Lancaster, 25½ m. N. of Preston, and 236 m. N.W. of London. It has a promenade along the shore, and also a pier and a winter garden. Pop. with Heysham, 33,800.

Mores, tn. of New S. Wales, Australia, in Cootamundra co., 130 m. N.W. by W. of Tamworth. Pop. 2300.

Morel, or **Morchella**, genus of fungi, of which the common M. (*M. esculenta*) is one of the most delicate edible Brit. fungi (q.v.). The cap is much wrinkled and ridged, and is attached to the stem from centre to edge. It is yellowish or buff in colour, and somewhat resembles a mass of honeycomb. Ms. are often dried for seasoning soups, sauces, and gravies, and are commonly used fresh in ragouts.

Morelia, city of Mexico, and the cap. of Michoacán state, 126 m. W.N.W. of the city of Mexico. It was named in honour of Gen. Morelos, the rebel patriot priest who carried on the struggle for independence despite the execution of Hidalgo, also a priest, whose fate he shared (1815), though only after he had called a national assembly and proclaimed Mexican independence for the first time in the hist. of the country. The tn. was founded in 1541, its location being determined by its situation, backed by a mt. range, and its proximity to the Rio Chiquito dry climate. Its cathedral was founded in 1610. It is reached from Mexico city (228 m.) by National Railways. There is some mining in the vicinity, but the chief products are agric. produce and cattle. Pop. 44,000.

Morelli, Giovanni (1816-91), It. patriot and art critic, b. at Verona. He exercised his influence as a member of Parliament to pass the M. Bill, which was directed against the alienation of works of art. In his *Die Werke italienischer Meister in den Galerien von München, Dresden, und Berlin* (1890-93), and again in his *Della Pittura italiana* (1890), he emphasised the need of making a careful study of ears, hands, and all detail, especially where the authorship of a painting was in question. He used the pseudonym of Ivan Lernolle.

Morelos: 1. State of Mexico, bounded by Mexico, Puebla, and Guerrero, and covering an area of 1916 sq. m. In the S., where it is fertile, coffee, sugar, and grains are extensively cultivated, while the N. part is mountainous. There is mining of zinc, copper, and silver. Cuernavaca is the cap. Pop. 182,711. 2. Tn. in the state of Nuevo Leon, Mexico, 45 m. S.E. of Monterrey. Pop. 4500. See also **NUEVA LEON**.

Morena, Sierra, range of mts. in Spain, stretching E. to W. between the Guadalu-

and Guadalquivir Rs. Minerals abound. Altitude 7900 ft.

Moreri, Louis (1643-80), Fr. encyclopedist, b. in Provence. In 1674 he pub. his *Grand Dictionnaire historique*, which was widely trans. The twentieth and best ed. of this encyclopaedia (pub. in 1750) is still consulted for biographies.

Moresnet, or Kelmis, part of Eupen and Malmedy, was, prior to the First World War, a com. and neutral ter. between Prussia and Belgium, 5 m. S.W. of Aachen. It has valuable forests and also some lead and zinc mines. After the war the allied powers assigned it to Belgium as compensation for damage done by the Germans to their forests. It now forms part of the prov. of Liège.

Moresque, see ARABESQUE.

Moreson Bay, bay on the E. coast of Queensland, Australia, 40 m. by 17 m., which is formed inside the is. of M. and Stradbroke. It was discovered by Cook in 1770.

Moretoy Cabaña, Agustín (1618-69), Sp. dramatist, b. at Madrid. He was a disciple of Calderón (q.v.). His finest comedy is *El Desdén con el Desdén* (Disdain met with Disdain), but his fund of humour, his excellent characterisation, and his animation are also apparent in *The Handsome Don Diego*, the heroic *Brave Justiciary of Castile*, and the farcical *Trampa Adelante*.

Moretto, commonly known as **Alessandro Bonvicino** (c. 1498-c. 1555), It. oil, fresco, and portrait painter, b. in Rovato, Brescia, Italy. He studied under Ferramola, in Venice under John Bellini and Titian; eventually he became a devoted admirer of Raphael, but it is not known that he ever visited Rome. Vasari says of his work: 'His heads are vigorous, in Raphael's style, though of very inferior excellence.' Moroni was a pupil of M. There are examples of his work in the galleries of Brescia, Florence, Venice, Verona, Berlin, Paris, and Vienna, and in the National Gallery, London, which contains a fine altar-piece.

Morgagni, Giovanni Battista (1682-1716), It. anatomist, b. at Forlì. In 1716 he became prof. of anatomy at Padua, a position he retained till his death. His reputation was made by his *Adversaria anatomica*, first pub. in 1706, and he may be considered the founder of pathological anatomy, his great work *De Sedibus et causis morborum per anatomem indagatis*, pub. in 1761, establishing pathological anatomy as a science. See life by Mosca, 1768.

Morganain, or **Morgue le Fay**, witch of Morganian legend, and sister of King Arthur, also known as Fata (fairy) Morgan, in the It. romances. In the romance of *Morte d'Arthur* she is the chief character, and discovered to Arthur the intrigue of Geneva with Lanvalot. She is a leading personage in numerous other tales of chivalry, and the various traditions in connection with her character have come down to us somewhat confused.

Morgan, Augustus de, see DE MORGAN.

Morgan, Charles Langbridge (b. 1894), Eng. novelist and critic, b. in Kent.

Entered Navy as cadet in 1907, serving in the Atlantic and on the China station. From 1914 to 1918 he was interned in Holland, and from 1919 to 1921 was at Balliol College, Oxford. Then joining *The Times* he was its dramatic critic from 1921 to 1926. From 1939 to 1940 he served in the Naval Intelligence Div. of the Admiralty. His first novel, *The Gun-room* (1919), was based on his naval experiences. His other pubs. include *My Name is Legion* (1923); *Portrait in a Mirror* (1929), which won the Femina Vie Heureuse prize in 1930; *The Fountain* (1932), which won the Hawthornden prize; *Epitaph on George Moore* (1935); *Sparkenbroke* (1936); a play, *The Flashing Stream* (1938); *The Voyage* (1940), which won the James Tait Black memorial book prize; and *The Judge's Story* (1948). His essays in *The Times Literary Supplement* were pub. as *Portraits in a Mirror* (1929) and *Second Reflections in a Mirror* (1944). His earlier works were marked by an elaborate style which gives way, in *The Judge's Story*, to a simpler and more direct narrative form. He is concerned with the spirit and the soul of the individual, and the attempt to preserve 'singleness of mind,' an idea finding perhaps its clearest expression in *The Flashing Stream*. In 1945 appeared another novel, *The River Fine*.

Morgan, Sir Henry (c. 1635-88), Brit. buccaneer and colonial governor, b. in Glamorganshire, of good farming stock. He was, apparently, kidnapped at Bristol and shipped to Barbados as a slave. M., however, joined the buccaneers, soon became their leader, and ravaged the Sp. colonies, his justification and that of the governor of Jamaica (Modyford), who gave him his privateering commission, being that the Sp. claimed exclusive possession of the Caribbean. It was only after M.'s victories that the Sp. king at length acknowledged England's title to Jamaica. The rapidity and skill with which M. secured his objectives proved him a born sea-captain and soldier. His most extraordinary feats were those at Puerto Bello (1668), Fort Chagres, and his sea-fight near Maracaibo. Puerto Bello was thought to be nearly impregnable, but M. overcame the guns of its 'iron castle' by the use of broad scaling-ladders which he forced his prisoners, including priests and nuns, to place against the walls of the fort while his men came on behind. On his return to Jamaica M. gave an oral account of his victory to Modyford, and his recital was sent to Westminster for the information of the secretary of state, it being evident that Modyford was uneasy over the extent to which M. was always exceeding the powers given under his privateering commission. However, after Puerto Bello Modyford gave M. a new commission, and it was decided to attack Maracaibo, which M. did with only 500 men in eight ships, the largest of which had but fourteen guns. M. sailed into the lake of Maracaibo, sacked the tn., and got out again through the narrow strait against four Sp. warships, this exploit being accomplished by the adroit use of a *brûlot* or fire-ship

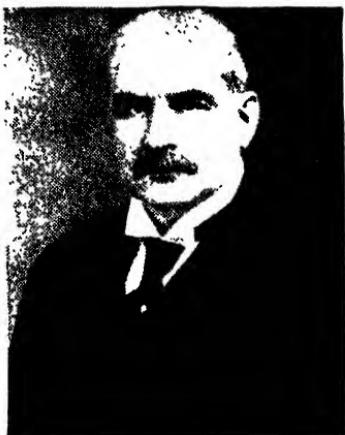
rigged up like a warship filled with dummy soldiers, which was driven against the first Sp. man-of-war and exploded, the remaining three ships falling an easy prey to M.'s men and to panic. After this M.'s name resounded through the Caribbean more than ever, and so great was the fear of him that the Spaniards often lost a chance of destroying him and his私atersmen through sheer cowardice. In 1669 there was a renewal of official hostilities with Spain, and a Sp. expedition from Florida ravaged the Eng. settlements in the Bahamas. Modyford and the Jamaican council then gave M. an admiral's commission, and made him commander-in-chief of all the ships at Port Royal, and bade him make war on the Spaniards. M.'s capture of the fortresses of Old Providence Is. and St. Catalina sealed the fate of Panama, for the Sp. soldiers feared to make a stand against the redoubtable M. except in Panama itself. M. set out from Chagres Castle with 1200 men in thirty-two canoes and sev. boats of artillery on Aug. 18, 1670, the march being one of the most dramatic events in the hist. of buccaneering, the hardships endured by the buccaneers through starvation (as narrated by Esquemeling) seeming incredible. In the result Panama, then a city of 30,000 people and 5000 stone houses and thousands of cedar-built dwellings, fell to M. (see also under BUCCANEERING). M.'s spoil in the years 1669-70 in gold pieces of eight alone was £240,000, besides a vast haul of silks, linen, gold and silver, lace, plate, and jewels. Complaints were received in England from the Sp. people of S. America, and M. was ordered to return to England to answer the charges made against him. He was sent to the Tower, but was soon afterwards released and was knighted by Charles II. in 1674, receiving the commission of lieutenant-general of Jamaica. He returned to Jamaica in that capacity, as senior member of the council and commander-in-chief. For a few months he was acting governor. He died in Jamaica.

The only first-hand source of the exploits of M. and of the facts pub. in the calendar of state papers, used by all later biographers, is the book *Buccaniers of America* (1678, Eng. trans. 1741 and 1893), written by J. Esquemeling (or Oexmalin), whose real name is given by some as Hendrik Smeeks, and who was a Dutch buccaneer who went with M. on all his sea-rover's exploits. Esquemeling suggests that M. won his remarkable victories by the most brutal methods, torturing prisoners to extract information or ransom, sacking and plundering the places he captured, and condoning the nefarious practices of his debauched followers. But allowance must be made for prejudice, particularly as M., after the sack of Panama, sailed away in haste without giving the other buccaneers their share of the loot; while further allowance is to be made for possible omissions and interpolations by Esquemeling's Dutch editor and translators who tinkered with his text in order to satisfy the national prejudices

of the Dutch and others. See life by J. C. Hutcheson, 1890; also C. Haring, *Buccaneers in the West Indies*, 1910; W. A. Roberts, *Sir Henry Morgan, Buccaneer and Governor*, 1933; and E. H. Cruikshank, *The Life of Sir Henry Morgan, with an Account of the English Settlement of Jamaica*, 1935.

Morgan, John Pierpont (1837-1913), Amer. financier, b. at Hartford, Connecticut, U.S.A. In 1857 he entered the bank of Duncan, Sherman & Company, and in 1871 became a member of the firm of Drexel, M. & Company, now M. & Company, the great bankers of the U.S.A. In 1901 he formed the Steel Trust with a cap. of \$1,400,000,000, and he was the controller of railways and ocean transportation lines. He had a vast collection of pictures and art treasures, and was a yachtsman.

Morgan, John Pierpont, junior (1867-1943), Amer. banker, b. at Irvington, New



Topical Press

JOHN PIERPONT MORGAN, JUNIOR

York, son of the preceding. He graduated at Harvard, 1889, and became a member of J. P. M. & Company, New York, and of M., Grenfell & Company, London. Chief legatee under his father's will, he inherited the art collections. On his father's death he succeeded to the directorship of New York Central and Hudson R. Railroad. Early in the First World War M. organised a New York bankers' syndicate with \$100,000,000 in gold. He acted for Brit. and Fr. Govs. as agent for purchase of supplies in America; also for the Amer. Gov. when it entered the war in 1917. Under the Dawes plan his firm issued loans up to not less than \$1,550,000,000. In 1920 he gave his London house at Prince's Gate for an Amer. embassy. M. left a gross estate of \$16,021,482 and a net estate of \$4,642,791, most of the difference being accounted for by federal and state taxes. In his

lifetime M. gave \$35,655,000 to charitable and public institutions, including \$14,750,000 to the Pierpont M. Library, \$9,000,000 to the Metropolitan Museum of Art, and \$4,000,000 to New York hospital. In 1933 he made over to trustees, as an institution to be used for research by the world's scholars, the magnificent library, valued at \$8,500,000, which had been collected by his father and himself in a superb marble building near the family residence in E. 36th Street. It contained about 25,000 vols. of illuminated MSS., early printed books, and examples of the work of famous presses.

Morgan, Lewis Henry (1818-81), Amer. ethnologist, b. near Aurora, New York. He practised as a lawyer at Rochester, New York, and made a study of the Indian tribes, particularly of the Iroquois, living amongst them for a time to learn their manners and customs. He pub. in 1851 *The League of the Iroquois*, containing the result of his researches. Other works include *The American Beaver* (1868); *Ancient Society* (1877); and *House-life of the American Aborigines* (1881).

Morgan, Sydney, Lady Morgan (c. 1783-1859), Brit. authoress, b. in Dublin, began her literary career with a vol. of poems, which she set to Irish tunes. She then wrote the novels *St. Clair* (1804) and *The Novice of St. Dominic* (1806), followed by *The Wild Irish Girl* (1846), which last estab. her reputation. In 1812 she married Charles M., M.D., whom the lord-lieutenant knighted. Two years later appeared her best novel, *O'Donnell*. During the later years of her life she pub. *Dramatic Scenes from Real Life* (1833); *Woman and her Master* (1840); *The Book without a Name* (1841); and *Passages from my Autobiography* (1859). See life by W. Fitzpatrick, 1860.

Morgan, Thomas Hunt (1866-1945), Amer. zoologist, b. at Lexington, Kentucky, son of Charlton H. M. He graduated at the State College of Kentucky, 1886, and became Ph.D. at Johns Hopkins Univ., 1890. He was prof. of biology at Bryn Mawr College, 1891-1904, and prof. of experimental zoology at Columbia Univ. His publs. include *The Development of the Frog's Egg* (1897); *Regeneration* (1901); *Evolution and Adaptation* (1903); *Experimental Zoology* (1907); *Heredity and Sex* (1913); *Mechanism of Mendelian Heredity* (1915); *Critique of the Theory of Evolution* (1916); *The Physical Bases of Heredity* (1919); *The Theory of the Gene* (1926); *Experimental Embryology* (1927); *The Scientific Basis of Evolution* (1932); *Embryology and Genetics* (1933); and monographs and papers on biological and embryological subjects.

Morgan, William Frend De, see De MORGAN, WILLIAM FREND

Morgan, par. of Glamorganshire, Wales, S.E. of Aberavon. Coal is found in the vicinity. Pop. about 10,000.

Morgana Fata, see FATA MORGANA.

Morgan & Company, J. P. Amer. banking house, estab. in 1860 in New York by J. P. M., senior. It attained the position of America's leading banking house, notably in connection with railroad

financing. The founder d. In 1913, and left the bank to J. P. M., junior and ten partners. In 1914 there was something of a sensation in financial circles in New York when members of the firm resigned their directorates in a large number of the greatest industrial and financial organisations in the U.S.A. This step, which was taken in response to public opinion, which disapproved of the system of 'interlocking directorates', had also a close connection with the passing of the Federal Reserve Banking Act, which completely revolutionised the banking system of the country. In the First World War the M. banking house, handling purchases on allied account aggregating \$3,000,000,000, made tremendous profits, and exercised no little influence on policy. After the war the house was a force in reparations policy. It directed Amer. loans to Europe and controlled the world's money markets. From 1923 to 1929 the total issues through M. syndicates were \$5,000,000,000. The net worth of the bank was \$30,000,000 in 1914, \$118,000,000 in 1929. But the economic depression of 1930 and the New Deal policy, particularly the Banking Act (*see under BANKS AND BANKING*), the Security Exchange Commission, and the Public Utility Holding Companies Act, adversely affected its position. The Roosevelt administration subjected the house to a series of investigations by the Senate, and the scandal connected with a former leader of the New York stock exchange and brother of a M. partner, so gravely damaged its prestige that its net worth fell to \$44,000,000 by 1938. But the house remains a powerful institution. Underwriting business was transferred to the new firm of M. Stanley & Company in 1935, and this new house became the first issuing house in America (1938). The parent firm maintains a strong position in the National City Bank of New York (*q.v.*), the Guranty Trust Company, the U.S. Steel Corporation, the General Motors Corporation, and other great concerns. Good relations with the Brit. Gov. are a tradition in the policy of its board. In 1910 the house of M. was incorporated as a trust company. All the members of the firm became directors of the company, which has a paid-up capital of \$25,000,000, and a paid-in surplus of the same amount. See F. L. Allen, *The Great Pierpont Morgan*, 1919.

Morganatic Marriage, name given to a marriage union, otherwise perfectly regular, between a man of the blood of a reigning royal family and a woman of lower social rank, e.g. the marriage of George IV. of England, when Prince of Wales, with Mrs. Fitzherbert. The issue of a M. M. are legitimate, though they are debarred from inheriting the rank and property of the father.

Morgan City, tn. and port of entry, Louisiana, U.S.A., on the E. bank of Atchafalaya Bayou, 20 m. from the gulf of Mexico. Pop. 7000.

Morgan Combine, *see ATLANTIC SHIPPING TRUST*.

Morgantown, city of W. Virginia, U.S.A., in Monongalia co., 60 m. S. of

Pittsburg. The W. Virginia state univ. was founded here in 1867. Pop. 16,600.

Morgarten, locality on the S.E. shore of Lake Aegeri, Switzerland. In 1315 the Swiss here defeated an army under Leopold of Austria.

Morghen, Raffaello (1758-1833), It. engraver, b. at Naples. In 1781 he engraved Raphael's symbolical representations of poetry and theology in the Vatican. He also engraved the chief works of Titian, Correggio, Poussin, Guido, da Vinci, and Murillo. His engraving combines exquisite delicacy and remarkable clearness. In 1794 he founded a school of engraving at Florence, at the invitation of Ferdinand III., grand-duc of Tuscany. Napoleon invited M. to Paris, and made him a member of the institute of France. His finest works are the 'Last Supper' from da Vinci; the 'Transfiguration' from Raphael; the 'Magdalen' from Murillo; and the 'Car of Aurora' from Guido. See his *Engraved Works*, ed. by Halsey, 1885.

Morgue, La, building in Paris, behind the cathedral of Notre Dame, where unknown bodies, either found in the streets or recovered from the Seine, are exposed for identification. After three days, if not claimed, they are buried.

Morgue le Fay, *see MORGAIN*.

Morhange, Charles Henri Valentin, *see ALKAN*.

Morhof, Daniel Georg (1639-91), Ger. author, b. at Wismar. In 1665 he became prof. of eloquence and poetry at Kiel, and in 1673 prof. of hist. there. His most famous works are *Unterricht von der deutschen Sprache und Poesie* (1682), a systematic hist. of European literature, and *Polyhistor, sive de auctorum notitia et rerum commentarii* (1683), an encyclopaedia of general knowledge and science. See life by R. von Lilienkron, 1885.

Moritz, Sigismund (1873-1942), Hungarian novelist, b. in Csécsé, son of a peasant farmer. He studied theology at Debreczen, and then came to Budapest to study law and literature. He began as journalist in the cap., but soon branched out as a naturalist novelist. His novel, *Rau Gold* (1910), destroys the Hungarian illusion of the moral purity and idyllic happiness of the people of the vils. and farms. One of his most successful works was *Behind the Back of God* (1911), in which he painted a sombre image of the middle class, stifled by the narrow life of a prov. tn. In 1922 he pub. *The Fairy Garden*, a novel the scene of which is laid in Transylvania in the seventeenth century. See A. Schöpplin, *Magyar irodák*, 1919, and J. Gassner, *Masters of the Drama*, 1940.

Morier, James Justinian (c. 1780-1849), Brit. traveller and novelist; secretary to the Brit. ambas., 1810, during the six years of his residence in Persia he became thoroughly acquainted with the character of the natives. Pub. *Journey through Persia, 1808-9*, in 1812. The best of his E. novels, entitled *The Adventures of Hajji Bahad of Isphahan*, appeared in 1824.

Morier, Sir Robert Burnett David (1826-1893), Brit. diplomatist, b. in Paris;

educated at Balliol College, Oxford, graduating in 1849. In 1851 he entered the diplomatic service, and subsequently held various appointments at Ger. courts. His knowledge of Ger. politics was unrivalled. In 1876 he was transferred to Lisbon as Brit. minister, while office he held until 1881, and then at Madrid from 1881 to 1884. From 1884 to 1891 he was ambas. to St. Petersburg, and at this time enmity sprang up between himself and Bismarck. At the outbreak of the Franco-Prussian war M. was wrongfully accused by Count H. Bismarck (q.v.) of giving information to Bazaine (q.v.). He was appointed to succeed Dufferin at Rome in 1891, but died before he could assume office.

Mörike, Eduard (1804-75), Ger. poet, b. at Ludwigsburg. From 1834 to 1843 he was a protestant pastor, but retired early on account of illness. He was appointed prof. of literature at the Katharinestift, Stuttgart, in 1851, an office he held for sixteen years. He belonged to the Swabian school of Uhland, and his *Gedichte* are, for the most part, simple lyrics, graceful in style and original in conception. He also wrote short stories and an autobiographical novel, *Maler Nortun* (1832). His complete works were ed. by H. Mayne (1914) and letters by K. Fischer and R. Kraus (1903). See life by K. Fischer, 1901; also L. Märtens, *Die Mythologie bei Mörike*, 1925, and W. Zemp, *Elemente und Auszüge*, 1939.

Morin, or Morinus, Jean (1591-1659), Fr. writer and theologian, b. at Blois. He was a Protestant clergyman at Leyden, but was converted to Catholicism and became a priest of the Oratory at Paris in 1618. He ed. the *Paris Polyglot* (1645), which includes the Samaritan Pentateuch and the Targum. M. claimed the superiority of the Samaritan over the Heb. version. He also wrote a Samaritan grammar and *Exercitationes* on the Heb. and Gk. texts of the Bible. A memoir of M. is prefixed to the *Exercitationes* (ed. 1669).

Morioka, tn. of Hondo, Japan, 85 m. S.E. of Aomori. Silks, textiles, and hardware are produced. Pop. 69,120.

Morioris, see under MAORIS.

Morionians, see EVANGELICAL UNION.

Moritz, Gustav, see ARMFELT, COUNT OF.

Moriax, seaport of France, off the N. coast of Brittany, cap. of the dept. of Finistère, and 33 m. E.N.E. of Brest. Many of the houses date from the fifteenth century. Pillaged by the Eng. during the Hundred Years war, when the tn. joined the League, its castle was stormed by Henri IV. (1594). The chief manufs. are tobacco and paper. Pop. 15,100.

Morland, George (1763-1804), Eng. painter, b. in London. He left his home in 1782 and abandoned himself to a dissolute and irresponsible mode of life, which renders his artistic achievement all the more remarkable. Indeed debt seems to have been his greatest incentive to work. His pictures deal with the mellower aspect of domestic and rustic life, and reveal great beauty of conception and harmony of execution. In his animal studies he approaches very near to Landseer. Of

his many fine pictures 'The Gypsies' (1790) and 'Inside of a Stable' are representative. See F. W. Blagdon, *Memoirs of George Morland* (1806). There are lives by G. C. Williamson, 1904; W. Sibey, 1907; and B. Henderson, 1923.

Morianwelz, tn. in Hainaut, Belgium, 11 m. E. of Mons, on the R. Haine, trib. of the Scheldt. It has coal-mines, foundries, workshops for railway material, and manuf. of cement. Pop. 8700.

Morley, Edward Williams (1838-1923), Amer. chemist, prof. of chem. at Western Univ., U.S.A. He carried out accurate determinations of the atomic weights of hydrogen and oxygen, and was associated with the Michelson-Morley experiment (q.v.).

Morley, Henry (1822-94), Eng. critic and man of letters, b. in London. His *How to make Home Unhealthy* (1850) attracted the attention of Dickens, who secured him a position on the staff of *Household Words* and *All the Year Round* (1850-65). M. was also editor of the *Examiner*. He was elected prof. of Eng. at King's College (1857), at Univ. College (1865), and at Queen's (1878), and in 1882 he became prin. of Univ. Hall, London. He wrote a number of critical and biographical works, including biographies of Jerome Cardan (1854), Cornelius Agrippa (1856), and Clement Marot (1871). His *First Sketch of English Literature* commanded great popularity. He was also the editor of M.'s *Universal Library* (63 vols., 1883-88, 1891), Cassell's *National Library* (205 vols., 1886), and the Carisbrooke Library (14 vols., 1889-92). See life by H. S. Solly, 1898.

Morley of Blackburn, John Morley, first Viscount (1838-1923), Eng. Liberal statesman and man of letters, b. at Blackburn, second son of Dr. Jonathan M. He was educated at Lincoln College, Oxford, graduating in 1859. He became quickly known in the literary world of London, being editor of the *Literary Gazette* and the daily *Morning Star*; and in 1867 he succeeded G. H. Lewes in the editorship of the *Fortnightly Review*. In 1878 he ed. for Macmillan the Eng. Men of Letters series, his own vol. on Edmund Burke (1879) being most masterly. In 1880 he became editor of the *Pall Mall Gazette*, on the staff of which were Alfred (afterwards Lord) Milner and W. T. Stead. In 1883 he was elected as a Liberal for Newcastle-on-Tyne. His intellectual stature, his powerful pen, and the influential position he held as an uncompromising exponent of philosophic Radicalism, marked him out for office; and in 1886, a canonical home ruler, he became Irish secretary in Gladstone's Cabinet, an office he occupied again in 1892, after the defeat on home Rule in the general election of 1886. In 1895 he was defeated as an anti-imperialist at Newcastle, but was returned for Montrose Burghs. He stood somewhat apart from politics during the Unionist administration of 1895-1906, being engaged on his *Life of Gladstone* (1903), but he was a strong opponent of the Boer war policy. In Sir H. Campbell-Bannerman's Cabinet (1906) M. became secretary of state for

India; in which capacity he met the outbreak of disorder with firmness, at the same time proceeding with his own plan for meeting the national demand for a widened share in the gov. In Asquith's first Cabinet, 1908, he was raised to the peerage, still retaining the India office; but in 1910 his age and health forced him to hand that office to Lord Crewe, while remaining in the Cabinet as lord president of the council. Being completely pacifist, he retired from public life on the declaration of war in Aug. 1914. M. was one of the original recipients of the Order of Merit at the coronation of Edward VII., 1902. Besides the works mentioned above



LORD MORLEY

he wrote, *inter alia*. *Voltaire* (1872); *Rousseau* (1873); *Diderot and the Encyclopedists* (1878); *The Life of Richard Cobden* (1881); *Walpole* (1889); *Oliver Cromwell* (1900); and *Recollections* (1917). See lives by J. L. Mordson, 1920; J. H. Morgan, 1924; and F. W. Hirst (with letters), 1927; also F. W. Knickerbocker. *John Morley and his Friends*, 1945.

Morley, Samuel (1809-86), Eng. politician, b. in London. He was a prominent dissenter, philanthropist, and temperance advocate. Owned a huge hosier business. In 1865 he became M.P. for Nottingham, but was unseated on petition in 1868, and was M.P. for Bristol, 1868-85. He was proprietor of the *Daily News* and a member of the London School Board, 1870-76. See life by E. Hodder, 1887.

Morley, Thomas (1557-1602 or 1603), Eng. musician, studied under Byrd. After being organist at St. Paul's, he was appointed to the Chapel Royal (1592); and six years later he was granted a twenty-one years' monopoly in music printing, in succession to Byrd. He excelled as a composer in madrigals; but he also devoted considerable attention to church

music and to instrumental composition. Some of his work appears in the Fitzwilliam Virginal Book; and he wrote some of the original music for the productions of Shakespeare, with whom he was personally acquainted. His theoretical treatise, *Plain and Easie Introduction to Practicall Music* (1597), was popular for two centuries and is one of the best sources of information on sixteenth-century methods of composition and musical life in general (a reprint appeared in 1937). See E. H. Fellowes, *The English Madrigal Composers*, 1921.

Morley, municipal bor. of the W. Riding, Yorkshire, England, 5 m. S.S.W. of Leeds. Machinery and woollen goods are manufactured. Pop. 23,400.

Morley College, London institution for adult education, founded in 1885 and named after Robert M., who supplied much financial assistance. Apart from a new wing built in 1937, the college was destroyed in an air-raid in Oct. 1940. It receives a maintenance grant from the L.C.C., and provides evening classes on a wide range of subjects, as well as weekly lectures on current affairs.

Morley-Minto Reforms, constitutional reforms introduced in India in 1909 by Lord Morley, as secretary of state for India, and the earl of Minto, as viceroy. These reforms enlarged all the legislative councils, accepted the elective principle, provided for non-official majorities of nominated *plus* elected members over official members, in all the provs., and of elected members alone in Bengal. They enabled the councils to vote on all matters of administration and gave Indians a direct share in it by admitting an Indian member to the executive council in each of the provs., and at the centre or gov. of all Brit. India.

'Mormon, Book of.' In Sept. 1823 Joseph Smith told of a vision he had received of a new gospel written on two gold plates, and after a series of other visions he claimed in 1827 to have been given these plates written in 'reformed Egyptian.' He was enabled to translate this with the aid of the anct. stones of divination, the Urim and Thummim, which were also given him. The trans. is known as the *B. of M.*, and after this had been made the plates, etc., were returned to an angel. Unbelievers, however, have declared that the *B. of M.* is clearly founded on an unprinted book by Solomon Spaulding, to which Smith might have obtained access. The book purports to give a hist. of religion in the Amer. continent from the time of Babel downwards to the fifth century A.D. It had been written by the prophet Mormon, and hidden by his son Moroni.

Mormon Church, called by its adherents 'the Church of Jesus Christ of Latter-Day Saints,' or shortly 'Latter-Day Saints,' was founded in the year 1830 by Joseph Smith in the U.S.A. About 1820, while living at Manchester, New York, Smith claimed, during a period of religious revival, to have received a vision of God the Father and God the Son. These visions continued and the further

revelation of the *Book of Mormon* (q.v.) was made to him in 1827. In 1830 he founded his sect (see MORMONS). In 1833 the *Book of Doctrines and Covenants* was pub. This, with the *Book of Mormon*, forms the basis of the M. belief. This is grossly materialistic. The theology reminds one at the first glance of the gnostic systems, with its numberless gods springing from a male and a female deity. The hierarchy is divided into two parts, the priesthood of Melchisedec and the Aaronic or Levitical priesthood. To the former belong the first presidency, patriarch, apostles, seventies, high priests, and elders; to the latter, bishops, priests, deacons, and teachers. The former is the more exalted, and the first president is supreme. The Ms. have carried on an energetic propaganda in Europe as well as in the States. The M. C. had an American membership of 774,000 in 1936, with 2072 churches. The Reorganised Church numbers about 105,000, with headquarters in Missouri. See J. E. Talmage, *Articles of Faith*, 1899, and A. Jenson, *Encyclopedic History of the Church of Jesus Christ*, 1941.

Mormons, History of the. After the foundation of the sect in 1830 (see MORMON CHURCH), a vigorous propaganda was carried on in the U.S.A., and was crowned with much success, among the converts being Brigham Young, who succeeded Smith as first president. In 1831 the whole body of saints moved to Kirtland, Ohio, later moving further W. to Jackson co., Missouri, where 'Zion, the New Jerusalem,' was founded. The prophet himself had trouble at Kirtland, where he managed sev. business enterprises. Here he and Rigdon, one of his chief followers, were tarred and feathered by the mob in 1832. The people also rose against the saints in Jackson co. In 1837 the first missionary enterprise was started, England being its object. The same year saw the failure of the bank which Smith had started. During the next year, after a conflict between themselves and the mob, the saints came into conflict with the gov. and were driven into Illinois. A settlement was made at Nauvoo, and the body increased so rapidly that it soon numbered 15,000. In 1841 a temple was commenced here. In 1843 Smith incited his followers to destroy the offices of a newspaper which had written against him, and was imprisoned in consequence at Carthage. Here the mob rushed the prison, and he and his brother Hyrum were shot. In 1845 the M. left Nauvoo and settled at Salt Lake city (1847), under the leadership of Brigham Young. Young d. in 1877 after a period of conflict with natives and the U.S. Gov. Utah, the ter. developed by the M., was admitted as a state in 1896, but not until the M. were forced by Act of Congress to give up polygamy. The Mormon Church dominates the politics of Utah and is also strong in the neighbouring states of Idaho and Wyoming. The Church, by reason of rigid adherence to the biblical system of tithes, is very rich. In 1852 the Reorganised Church of Jesus Christ of Latter-

Day Saints had come into existence, differing from the main body in seven essentials, especially polygamy, which the Reorganised Church renounced as not being in accordance with the wishes of their founder. The Reorganised Church is now recognised as continuing the traditions of Mormonism in its purest form.

See W. A. Linn, *The Story of the Mormons*, 1901 and 1923; J. E. Talmage, *The Vitality of Mormonism*, 1919, and *The Story of Mormonism*, 1920; W. E. La Rue, *The Foundations of Mormonism*, 1919; E. E. Erickson, *The Psychological and Ethical Aspects of Mormon Group Life*, 1922; J. F. Smith, *Essentials in Church History*, 1924; F. S. Harris and N. I. Butt, *The Fruits of Mormonism*, 1925; H. Standage, *The March of the Mormon Battalion from Council Bluffs to California*, 1928; J. A. Gove, *The Utah Expedition*, 1928; S. V. Gates, *The Life Story of Brigham Young*, 1930; and N. Anderson, *Desert Saints: the Mormon Frontier in Utah*, 1912.

Morne-à-l'Eau, maritime vil. of Guadeloupe, W. Indies, a few miles from Pointe-à-Pitre, on the is. of Grande-Serre. Pop. 6400.

Morning Glory, popular name of various species of *Ipomea purpurea* of the order Convolvulaceae. They are twining climbing bindweed herbs, with heart-shaped leaves and large funnel-shaped flowers, crimson, blue, purple or white, or striped. Ivy-leaved and other forms occur. *I. purga*, or jalap (q.v.), is also a species.

'Morning Post', prominent Conservative penny daily which enjoyed the distinction of being the oldest of the then existing London dailies, having started in 1772 as the rival of the celebrated *Morning Chronicle* (see *under NEWSPAPERS*). It was notable for court news and social gossip, a legacy from the time of the gallant 'Parson Bate,' who became its editor in 1775, and who, by his free and fearless comments upon the events of the day, no less than by his scintillating paragraphs of court doings and the movements in the world of fashion, set the new paper on the high road to popularity. Charles Lamb, Samuel Taylor Coleridge, Robert Southey, Wordsworth, and Sir James Mackintosh were noted contributors. Its later prosperity was largely the result of the industry of the Glenesk family—Algeron Borthwick (subsequently Lord Glenesk) by unremitting efforts freed the paper from its heavy debts which had gradually accumulated. In 1877 Borthwick became sole proprietor, and from the time he reduced its price from 3d. to 1d. the paper's success became prodigious as a powerful Conservative organ. From 1897 to 1905 the paper was fortunate in having as its editor James Nicoll Dunn; and during the Boer war it gained a tremendous vogue from the messages of its war correspondent, Winston Churchill. After the death in 1908 of Lord Glenesk, the M. P. passed into the hands of his only surviving daughter, Lady Bathurst. The eighth duke of Northumberland was chairman of the board of directors till his death.

in Aug. 1930. After 1911 the paper was ed. by H. A. Gwynne. In the succeeding years, however, the social and political outlook of the *M. P.*, always extreme Tory, was shared only by a rapidly declining section of newspaper readers, and the paper appeared for the last time on Sept. 30, 1937. It was amalgamated with the *Daily Telegraph* the following day. See C. Pebody, *English Journalism*, 1878, and W. Hindle, *The Morning Post*, 1772-1937, 1937.

Mornington, Garret Wellesley, first Earl of (1735-81). He was the son of Richard Colley Wellesley, first Baron M., and father of the duke of Wellington. He was educated at Trinity College, Dublin, and in 1757 became M.P. for Trim, co. Meath, in the Irish House of Commons, going to the House of Lords on his father's death the next year. In 1760 he was raised to the peerage as Viscount Wellesley of Dangan Castle, and earl of M. He was an accomplished musician.

Morny, Charles Auguste Louis Joseph, Comte de (1811-63), Fr. politician, b. in Paris. He was reported to have been half-brother to Louis Napoleon, and was adopted by the comte de M. He entered the army in 1830, and served in Algeria. In 1838 he left the service and estab. a beetroot-sugar factory. He was elected to the Chamber of Deputies in 1842. At the revolution of 1848 he was elected to the Legislative Assembly, was a staunch supporter of Napoleon III., co-operated in the *coup d'état*, and became minister of the interior. He was president of the Corps législatif (1854-65) and ambas. to Russia (1856-57). See F. Loliée, *Le Duc de Morny et la Société du Second Empire*, 1909, and M. Boulonger, *Le Duc de Morny*, 1925.

Moro (van Dashorst), Antonio, or Sir Anthony More (c. 1525-81), Dutch painter, b. at Utrecht. He studied under Titian in Italy during 1550-51, and in 1552 visited Spain. In 1553 he came to England as painter to Queen Mary, remaining till her death in 1558, when he went into the service of Philip II. of Spain at Madrid. In 1568 he returned to Holland, and settled at Antwerp. He was a popular and successful painter of portraits. See lives by H. Hymans, 1910, and G. Marlier, 1934; also M. J. Friedländer, *Allniederlandische Malerei*, 1936.

Morocco, or Marocco (El Maghreb el Aksa), the furthest W., largest of the Barbary states, with a total area, according to current estimates, of about 172,000 sq. m. (or 167,220 sq. m.) for the three spheres of influence. Older estimates gave the area as 219,000-220,000 sq. m., the difference being explained by the uncertain S. boundary. M. is situated in the N.W. corner of Africa, its N. coast being washed by the Mediterranean, and the W. by the Atlantic; the E. boundary, which marches with Algeria, has been settled by the protectorate treaty (see below under *Spheres of Influence and Government*) between France and the sultan; while the S. merges indeterminately in the Sahara. The country is traversed by several parallel ranges of the

Atlas Mts., the highest point being Tizi-n-Tagharet (15,400 ft.) in the Great Atlas. The mt. system in M. is more complicated than in Algeria: the main range is constituted by the Great Atlas; roughly parallel to but further S. of it is the Anti-Atlas, or Saharan Atlas following the general trend of the whole Atlas complex to the N.E. From the S. flanks of the Anti-Atlas run torrents that irrigate long oases before losing themselves as wadis in the desert sands. N. of the Great Atlas is the Middle Atlas, which, in some parts, is well wooded, and is the haunt of the small lions of Barbary. The N. slopes of the ranges are for the most part well wooded, and between them lie well-watered and fertile plains, while the S. slopes are exposed to the dry winds of the desert, and are generally arid and desolate. Beyond the Atlas lies the desert, scored by the oasis valleys of the Draa and Sus. Here on the mt. range may be seen huge *kasbahs* or feudal strongholds, looking rather like the tall Arab buildings of San'a in the Yemen or other similar buildings in S. Arabia, and comparatively modern. They served as outposts of imperial authority, and were built by Mulay Ismail, the most famous monarch of the present dynasty; later they became centres of resistance of local rulers. The rvs. flowing from the N. slopes of the Atlas are perennial, and of great commercial value: the Muluya, with its trib., the Sharef, drains the N.E. of the country and enters the Mediterranean after a course of 400 m.; the Sebou, by removal of a sandbank at its mouth in 1905, was found to be navigable as far as Fez (125 m.). Other rvs. are the Um'er Itebiah (230 m.), the Tensift (190 m.), the Sus, the Ghir, and the Draa, all flowing into the Atlantic. The other rvs. are lost in the sands of the desert. The Mediterranean coast is rocky, and contains many bays and inlets, including the bays of Alhucemas, Tetuan, and Tangier, the last-named containing the best harbour in M. The most northerly point is the peninsula of Ceuta, dominated by the Jeb-el-Musa, and separated from Europe by the straits of Gibraltar. The Atlantic coast is low and sandy for the most part, the trade of the ports of Larache (El Arish), Rabat (with Saffi), Casablanca, Mazagan, Safi, and Mogador being greatly hampered by the lack of safe harbours. Casablanca is the chief port: Rabat has a good riv. harbour, but it is obstructed by a bar; Safi has only an open roadstead. The harbour of Tetuan on a riv. entering the Mediterranean requires to be cleared of sand. The Jeb-el-Musa or Ape's Hill dominates the promontory, and, with the rock of Gibraltar, was known to the ancients as the Pillars of Hercules, the W. gateway of the Mediterranean. Between 32° N. and 30° N. is the headland of Ghir, enclosing a bay and the port of Agadir, once known as the 'gate of the Sudans.' The climate of M. is generally good and healthy, especially on the W. coast, the country being sheltered thereby by the Atlas Mts. from the hot winds of the desert. The extremes of temp. in Tangier

and Mogador are, in the summer, 92°, in the winter 37° (the temp. at Mogador generally ranges from 60° in Jan. to 75° in Aug.), with a rainy season between Nov. and April; but the summer heat at the intermediate ports, Casablanca, Larache, Safi, and others, is appreciably higher. The winter Mediterranean coast is drier and less temperate, while in the interior it is intensely hot in summer.

Population and Towns.—The native pop. consists mainly of Islamic Berbers, known locally as *Ainazigh*, who live mainly in the mts., and Arabs dating from the invasions of 700 years ago, who now inhabit the plains. These stocks have to some extent intermingled with each other and with people of Negroid descent. Moors, of mixed Berber-Arab descent, inhabit the tns. In the mountainous regions of the S., as in the N. Rif, the people are pure Berbers, and follow their own laws and customs. The S. Berbers are sheep-herders and horse-masters. The Arabic-speaking people of the plains are fairly homogeneous, rather similar to the 'Arab' pop. of E. Barbary. The Negroid admixture is palpable everywhere in M. except in the mountainous regions. Some of the Sherifian families (i.e. those claiming descent from the prophet) are almost blond. N. Africa contains nearly two-thirds or nearly 31,000,000 of the speakers of the Arabic language, and of these some 7,000,000 are in M.; but a considerable proportion of the pop. is bilingual in Arabic and Berber, though some Moroccans know no Arabic. Berber or Shilkah is the language of the mt. dists., but Arabic of the tns. and plains. From 1912 the European element greatly increased owing to the influx of Fr. into the tns. of the Fr. zone and of Fr. colonists in agriculture, and a most marked increase occurred in the early years of the Second World War due to the influx of refugees from France, whilst M. was in effect also used as the camp for as large a number of the Fr. Army as could be transported there. The 1946 census of the Fr. zone gave a total pop. of 8,993,000, including 8,447,000 native Muslims, 208,000 native Jews, 338,000 Fr. and other Europeans, being an increase of more than 40 per cent of the 1936 total. The 1940 census of the Sp. zone gave a total of 991,900, including 914,000 Muslims, 63,000 Europeans, and 15,000 Jews. The pop. of the Tangier zone in 1941 was 100,000 (36,500 native Muslims, 16,500 Europeans, and 7000 native Jews). The pop. of the prin. tns. of the Fr. zone in 1946 was Casablanca 505,000 (107,000 Europeans); Marrakesh 241,000 (11,000); Fez 221,000 (17,000); Meknes 153,000 (21,000); Rabat 148,000 (35,000); Oujda 86,000 (24,000); Sale 52,000 (2000); Safi 48,000 (2500); Mazagan 38,000 (2000); Port Lyautey (Kenitra) 35,000 (6000); and Mogador 32,000 (1000). In 1936 the pop. of Casablanca was 257,400; of Marrakesh 190,000; Fez 144,400; Rabat 83,000; and Meknes 74,000. Casablanca was transformed in ten years from a collection of hovels into a great modern tn., with a splendid port; Meknes is also a relatively modern city

situated around the remains of a large flimsy imperial palace built to rival Versailles by an eighteenth-century sultan. Fez, Marrakesh, and Rabat are also fine tns. The reason why Fr. M. can boast such fine modern cities is that the celebrated pro-consul, Lyautay (*q.v.*), when virtually dictator of M., used large credits drawn on the military budget for development, unhampered by parl. control, though these achievements were purchased at the price of much indebtedness and the domination of such great financial concerns as the Banque de Paris et des Pays Bas, which once directly or indirectly controlled much of the economic life of the protectorate. The prin. tns. of the Sp. zone are Tetuan (1940) 73,000; Larache 36,000; Alcazarquivir 33,000; Sheshawen 12,000; Arzila 11,000; Villa Nador 9000; and Villa Sanjurjo 7000.

Spheres of Influence and Government.—In theory M. is an absolute monarchy, in which the sultan, Sidi Mohammed, who was proclaimed sultan in 1927, on the death of his father, Moulay Youssef (reigned 1912-27), exercises supreme religious and civil authority; but actually the country is divided into three spheres of influence, the Fr. zone, the Sp. zone, and the international Tangier zone—in each of which a different system of government prevails through the combined operation of the protectorate treaty signed by France and Spain on March 30, 1912, the subsequent convention between those two powers of Nov. 27, 1912, and the tripartite convention between Great Britain, France, and Spain of Dec. 18, 1923, which latter provided for a special statute in the Tangier zone.

The Fr. zone comprises all M. (excepting the Ifni enclave and Cape Juby area) from the Atlantic to the Algerian border, and from the confines of the Sahara to the boundary of the Sp. zone. The Franco-Sp. boundary follows an easterly direction from a point on the Atlantic about 16 m. S. of Larache to the R. Moulouya. The Sp. zone comprises the area between this line and the sea, with the exception of the small Tangier zone. The S. and E. boundaries of M. being largely indeterminate no precise estimate of the total area can be made, but it is approximately as follows: Fr. zone 153,870 sq. m.; Sp. zone 18,000 sq. m.; Tangier zone 225 sq. m.; total 172,095 sq. m. (other estimates give the Sp. zone as only 13,350 sq. m., including Tangier). Until her collapse in the Second World War in 1940 France was the paramount power in M., and represented the sultan in foreign relationships; but in 1945 Fr. influence was restored. The sultan resides in the Fr. zone, usually at Rabat, though sometimes at other traditional caps., Fez, Marrakesh, or Meknes. His gov. or *maghzen* consists of the grand vizier and viziers of justice, public instruction, pious foundations (analogous to the Egyptian Waqfs), and others. All *de facto* authority, however, in the Fr. zone is exercised by the protecting power through its representative, the resident-general, who is minister of foreign affairs to the sultan and head of a Fr. adminis-

tration with headquarters at Rabat, comprising all the usual gov. depts; finance, public instruction, economic affairs, etc. The Fr. authorities have enacted a large body of modern law designated as imperial edicts (*dahiras*) of the sultan, but promulgated by the resident-general. All decrees, even those of minor importance, must be approved by the protectorate authority. Local native affairs are administered by native *pashas* or *kaidas* under Fr. controllers. Spain has had relations with M. for centuries. The Sp. zone is under the sultan's *khalifa*, whom he selects from candidates presented by a Sp. high commissioner resident at Tetuan, and assisted by a delegate-general and a number of other delegates in charge of various gov. depts. Sp. authority in this N. sphere of influence was confirmed by the successful military operations against Abd-el-Krim in 1926, and the final pacification of the Fr. and Sp. zones in the succeeding year. Spain occupied Ifni in 1934, since when the ter. has gained some importance from its transit trade with the hinterland. A special international regime was designed for Tangier before the First World War by negotiation between Britain, France, and Spain but, owing to the war, did not come into operation. A new convention, instituting the international zone, was signed by all three powers in Paris on Dec. 18, 1923, and came into force on June 1, 1925. This convention was modified by a protocol of July 25, 1928, by the three powers, together with Italy. It provided for a complete international administration of the zone except for native affairs, which were reserved to the Sherifian authority. Brit. capitulatory (see CAPITULATIONS) rights in the Fr. zone were abolished in 1938, but are still retained in the Sp. zone, and there is a Brit. postal agency at Tetuan subordinate to the central Brit. post office at Tangier. The international zone is permanently neutralised and demilitarised. Legislative power is vested in an International assembly of twenty-seven members, but the parties to the Tangier statute agreed on a special code of law. A right of veto is vested in a committee of control, consisting of consuls-general of the powers. The administration of the zone is in the hands of an administrator and his departmental assistants. The sultan of M. is represented by a *mendoub*, who is *ex officio* president of the assembly, and has charge of native affairs. During the Second World War, in 1941, Sp. Khalifan forces occupied Tangier, and Spain was in *de facto* control of the zone until 1943. In that year a conference was held in Paris between representatives of the W. Allies to discuss the restoration of the international regime in Tangier. It was decided to put into force, with modifications, the statute of 1928, and the last Sp. troops left the zone and the sultan's *mendoub* returned to take up residence; but the present regime is temporary, pending the revision of the status of Tangier and the reorganisation of its gov.

Production and Industry.—Before the advent of Fr. influence the gov. of M. was of the most fanatical, holding all Christian nations in contempt and aversion. Foreign commerce was, therefore, unsought and the exportation of valuable commodities, like esparto grass and grain, was discouraged by high export duties, thereby preventing the fertility of the soil from being greatly utilised. There were no railways, no wheeled transport, and no internal navigation. All goods were borne by camels or other beasts of burden, and the only ports open to European commerce were Tangier and Mogador. But great changes followed on European intervention, coupled with the natural fertility of the soil, and a great many farms have been sold to European settlers, who are developing agriculture by modern methods, such as mechanisation. In the Fr. zone agriculture is the leading industry, producing wheat (about 1½ million quintals in 1945), barley (2½ million quintals), maize, and other cereals, linseed, beans, chick-peas, esparto grass, cumin, coriander, birdseed, and hemp. The fruit-bearing trees of the N. slopes of the Atlas produce many fruits, particularly almonds, wines, and olives, and also fig, walnut, orange, lemon, plum, apricot, and dates. The 'citrus' or gum sandarach-tree and the argan-tree are found near Mogador. Other trees grown are cork, cedar, and oak. The palmetto is widely grown for its vegetable fibre, and the tiza-tree for its tanning bark. Nearly 8,000,000 gallons of wine were produced in 1945. Agriculture in the Sp. zone has possibilities, but is undeveloped. Wheat, barley, and chick-peas are grown in the Tangier zone. The mineral resources of M. are known to be great, the chief mineral exploited being phosphates, the output of which under a state monopoly reached nearly 1,750,000 tons in 1945. Important deposits of coal, iron-ore, lead, zinc, and, in smaller quantities, copper, antimony, manganese, gypsum, and other minerals are being increasingly exploited as native antagonism is overcome. Iron ore mined in the Rif is exported from Melilla in the Sp. zone.

The fauna of M. includes the leopard, bear, hyena, and wild pig; the bustard, partridge, and water-fowl abound; the dromedary and horse are bred extensively, as also are cattle, sheep, mules, asses, and goats. There are abundant fish off the coasts, and the fishing centres near Casablanca and at Fedhala have a preserving industry. The manufs. include leather, pottery, textiles, carpets, embroideries, copper and brass goods, silver filigree, slippers, and shawls. Various miscellaneous industries have grown up in recent years for local consumption, including flour mills, cement factories, soap and candle factories, and breweries. The trade of M. is now chiefly with France, Great Britain, the U.S.A., and Spain. The chief exports are phosphates, wheat, fish, wool, palmetto fibre, hides, skins, eggs, cattle, sheep, pigs, barley, almonds, linseed, gums, and Taflet dates. Some native manufs., such as fez caps and

leather, are exported to various parts of Africa. The chief imports are cotton, sugar, tea, hardware, petrol, coal, motor vehicles, edible oils, flour, semolina, and wine. The Sp. zone exports iron-ore, lead, cork, skins, and vegetable fibre; and the chief exports from Tangier are preserved fish, skins, M. leather, and eggs.

Commerce.—Fr. zone: imports in 1946 were valued at 17,529,000 fr.; exports at 10,395,000 fr. In the Sp. zone imports in 1944 were 314,202,000 pesetas; exports 93,711,000 pesetas. Tangier zone: imports, in 1944, 181,357,000 fr.; exports 14,630,000 fr. Imports from M. to Britain in 1947, were valued at £3,771,776; exports to M. from Britain were £1,449,422. The foreign commerce of M. is characteristic of a developing country, the imports

Rabat, Casablanca, and Mogador. There are Brit., Fr., and Sp. postal agencies at the ports of Fez and Marrakesh. Telephones are in use in all the prin. tns., which are connected with the European systems through Ceuta. There is a daily air service between Barcelona and Melilla, stopping at Madrid, Seville, Tangier, and Tetuan. Air services by Air France have been re-established between Rabat and Paris and Bordeaux. There is also a B.O.A.C. service between Rabat and the United Kingdom via Lisbon.

Religion, Education, and Justice.—The religion of the country is a strict form of Mohammedanism, much purer than that practised in Turkey and Persia. The bulk of the native pop. is illiterate. There are numerous Koranic schools which give



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much more valuable than the exports, indicating an excess of investment.

Communications.—There are about 860 m. of normal-gauge railways in operation in the Fr. zone, the Fr. authorities having begun serious development in 1939. In addition, the completion of the Tangier-Fez full-gauge line affords through service between Tangier and the chief tns. of the Fr. zone, and a normal-gauge line connects Fez with the Algerian frontier at Oujda. Casablanca is joined by rail with the Algerian border and Tunis, and with Marrakesh by two branch lines, one eastward via the Khouribga phosphate lines, the other to Saïss and Oujda. The existing railways in the Sp. zone are Ceuta to Tetuan, Larache to Alcazar, and Nador to Tistutin. There are about 2800 m. of first-class roads and about 2000 m. of second class. The Sp. zone has some 500 m. of good roads and the Tangier zone 65 m., but the highway S. from Tangier to the M. line of demarcation is the only really first-class road in Sp. M. There are submarine telegraph cables from Tangier to Cadiz, Tarifa, and Gran, and wireless stations at Tangier,

a very elementary education, and a number of higher schools attached to mosques. The most notable is the Kairoueen Univ. at Fez, which has high repute in the Islamic world. In the Fr. zone education on European lines is given in the Fr. schools, and schools are provided by the protectorate gov. for Moslem natives. There are state schools in the chief tns. of the Sp. zone and certain Hispano-Arabic schools for natives. Native justice is administered in the Fr. zone by religious courts, and the *paschas* or *kaidas* also have a wide jurisdiction in both civil and criminal cases, subject to supervision by a Fr. controller. Two courts of appeal have been set up at Rabat corresponding to these jurisdictions. Fr. courts modelled on those in the metropolitan country were set up in 1913 to deal with cases by or against Fr. and other foreigners. The Fr. courts are the court of appeal at Rabat and the courts of first instance at Rabat, Casablanca, Marrakesh, Fez, and Oujda. Rabbinical courts have jurisdiction in cases on the personal status of Jews. Native and Jewish justice in the Sp. zone is similar to that in the Fr. zone, except

that all criminal cases are tried in the Sp. courts. In the Tangier zone native justice is administered as in the Fr. zone, the *mendoub* having a jurisdiction similar to that of the *pushas* and *kaidas*.

History.--The known hist. of M. begins in the eighth century with the introduction of Islam and the estab. of the dynasty of a branch of Mohammed's family, the Idrisis, contemporary with Haroun al-Rashid. A succession of dynasties, of which the most famous were the Almoravides (*q.v.*) and Almohades (*q.v.*), ended in that of Filali, originally Sherifs of Taflet, which reigned from 1546 to the present day. What brought the Sherifs to power as rulers of M. was their fight against Portugal, which ended in 1578 with their conquest of all M. except Mazagan. Their govt. was an absolute despotism, opposed to all progress and corrupt in administration, and European intervention had been necessary at different periods. During the Fr. conquest of Algeria M. adopted an anti-Fr. policy by helping and, later, sheltering, the formidable Abd-el-Kadir; but with his defeat and capture at Isly (1843) Franco-Moroccan relations were peaceful during the second half of the nineteenth century. None the less the Moroccan problem remained to be solved. Since 1878, despite Brit. objections, a Fr. military mission had been stationed at Fez. The Madrid convention of 1880 was an agreement to maintain the *status quo*. Fourteen years later Abd-el-Aziz, secretly aided by Germany, launched a number of guerrilla attacks which threatened to imperil European interests generally. In 1904 by the agreement of April 8, which permanently settled the question of Egypt, England gave France a free hand in M. and a few months later France signed an agreement with Spain, which defined their respective spheres of influence. In 1906 the Ger. emperor, Wilhelm II., visited Tangier with the object of protesting against the Anglo-Fr. agreement, and the tension between France and Germany became acute. In 1906 an international conference was convened at Algeciras to define the interests of the various powers, and to establish order in M. by means of an organised police force. This conference laid down the principle of the 'open door' in M. Between 1906 and 1911 there were various conflicts between the Fr. troops and the Moroccan tribesmen, and at Melilla between the Spaniards and the Rifian mountaineers. In 1908 the sultan, Abd-el-Aziz, was defeated and deposed by his brother, Mulai Hafid, who was recognised by the powers in 1909. In 1911 fresh troubles began. Fez was besieged by the rebels, but relieved by the Fr. (May 21), while a Sp. force at Larache dealt with the Rifian rebels. In July 1911 the Ger. gunboat *Panther* anchored in Agadir harbour ostensibly to protect Ger. interests. After protracted negotiations between France and Germany the latter left Agadir and relinquished all claims to the country in return for compensation in the Congo. In 1912 the Sultan Hafid abdicated, and was succeeded by his brother Mulai Tusef.

During the same year the Franco-Sp. treaty divided the country into the above noted spheres of influence or protectorates; but the arrangement was not accepted peacefully by the various tribes, and very quickly the Sp. zone became the arena of contention and guerilla warfare, which quickly involved the Fr. area as well.

Poincaré thought that a distinguished soldier should be placed at the head of the new protectorate and Gen. Lyautey (*q.v.*), appointed on account of his colonial record, showed himself to be a great modern pro-consul both as builder and reformer. The Fr. troops were beginning to overcome their chief difficulties when the First World War broke out in 1914, and the Moroccan Army, which contained some of the best-trained Fr. troops, was needed at home. Lyautey had to maintain order and continue his constructive work with weak effectives and also to repel constant attacks organised by Mulai Hafid and a son of Abd-el-Kadir, who had been armed by the Ger. After the treaty of Versailles the Fr. reduced their last opponents, the Beni-Quarain, and occupied the region of Quezzane. By that time the network of roads constructed by Lyautey was almost completed, and this was the moment chosen by a new adversary, Abd-el-Krim (*q.v.*), who had won some influence by his defeat of the Sp. at Annual in 1921, to attempt a coup against France. At first Abd-el-Krim won a few successes and stirred up trouble in the region N. of Fez. But an expedition under Gen. Boisduval proved successful, and by 1930 only the Taflet and the Bou-Denib plain remained to be conquered. Ten years later M. completely pacified, administered on modern lines, weathered Fr. reverses in the Second World War. After the armistice of 1940 not a single hand was raised against the Fr. protectorate. Marshal Lyautey's achievement was the reason for the continued loyalty of the colony. He settled the judiciary problem and, as a supreme guarantee of Moroccan rights, introduced courts of appeal. He laid the foundations of free public education; he provided schools for the sons of notables, Muslim colleges, and practical primary schools. By agric. colonisation, and by carrying out an immense public works programme, he created economic prosperity. He introduced the registration of deeds in a country where no land statute had previously existed. Large tracts were purchased by the protectorate for settlers and for public works. In a country where the Muslims habitually sell unwillingly, but Lyautey succeeded in carrying out this part of his programme without conflict, acting always without injustice or arbitrariness. Like a Rom. pro-consul, Lyautey, with a view to military operations as well as for other reasons, planned an immense network of roads and built them in fifteen years. Finally he regulated the exploration and exploitation of values, though the mineral wealth of M. is still far from being completely exploited, particularly the reserves of oil; the discovery, however, of an important oil deposit was made at Jebel

Tsclafat in 1934. The gov. of the Tangier zone was planned before the First World War by negotiations between the Fr., Brit., and Sp. Govs., and though the plan was delayed by the European outbreak, an agreement embodying its terms was signed by the three powers in Paris on Dec. 18, 1923, and brought into force in June 1925. This convention was somewhat modified by a protocol signed at Paris in 1928, to which Italy became an additional subscribing member (see further under *Spheres of Influence and Government*). The Sp. zone was the base of Gen. Franco's military rising against the Sp. republic in 1935 and Moroccan troops, known as *Moros*, played a great part on the Nationalist side. The Tangier Convention of 1923 was automatically renewed in 1936 for a further twelve years. The zone was occupied by Sp. troops in June 1940. In 1941-12 Hitler put heavy pressure on Franco to give passage to German troops by land and the use of Sp. air-fields, so as to complete the policy of infiltration into M. and thereby acquire control over Brit. Atlantic communications. But whatever progress he may have made in these machinations was abruptly nullified in Nov. 1942, when a large Anglo-Amer. force occupied M. and Algiers and thereby began the first phase of the N. African campaign for the control of the Mediterranean. At Casablanca, Jan. 14-24, 1943, President Roosevelt and Mr. Churchill, together with their leading political and military advisers, arrived at general agreement on broad strategic plans for the conduct of the war against the Axis (see CASABLANCA CONFERENCE).

Although the Fr. protectorate has been in existence for less than forty years, and although the final pacification of M. was not completed until 1934, the Fr. have in that relatively brief period transformed the country almost beyond recognition. Before 1912 internecine and fratricidal warfare was the rule rather than the exception; the authority of the sultan was confined to a few dists., most of the country being ruled either by tribal chiefs and usurpers or by powerful brigands. To-day lawlessness has dwindled almost to nothing; standards of public health and education are incomparably higher; excellent roads or railways--many of them electric--cover the country from the N. right down to the Sahara. The present (1949) Fr. resident general and commander-in-chief, Gen. Juin, who assumed office in May 1947, is a most efficient administrator who, within two years, has succeeded in suppressing the insecurity and lawlessness that were an inevitable aftermath of the world war. Marshal Lyautey, the first resident general, began to prepare the Moors for ultimate self-government, at the same time strengthening the authority of the sultan. But not all his successors have followed his policy. Although it is stated on high authority that ultimately France envisages nothing less than total independence for M., the nationalists there contend that the Fr. administration at Rabat does little to further the cause.

Moors are excluded from higher and even medium rank civil service posts; they receive little if any training for future responsibility; there are next to no native technicians, economists, or doctors in the making. At the same time there is a constant flow of Fr. experts, whom at present the Moors could not replace, but also of lower officials, police, engine drivers, and postmen from France. Yet most of the Moors realise that any sudden withdrawal of the Fr. would result in chaos, and that they are not ready for self-government. Potentially M. is among the richest countries in the world; but on the whole hardly 1 per cent of the mineral wealth is exploited. Fr. capital and technical resources are insufficient for a more thorough exploitation. Again, as regards agriculture, the output could, with more widespread irrigation and the application of modern techniques, probably be trebled; but a general modernisation of agriculture in M. would need a capital outlay far beyond the present means of France.

See J. G. Jackson, *The Empire of Morocco*, 1809; Ali Bey el Abbassi, *Travels in Môrocco, Tripoli, etc.*, 1803-7, (2 vols.), 1816; N. G. Rolph, *Adventures in Morocco*, 1874; W. B. Harris, *Taflet*, 1895; J. Thompson, *Travels in the Atlas Mountains and Southern Morocco*, 1899; Budgett Meakin, *The Moorish Empire*, 1899. *Land of the Moors*, 1901, and *The Moors*, 1902; Canal, *Géographie générale du Maroc*, 1902; H. Lorin, *L'Afrique du nord*, 1906; F. Moore, *Passing of Morocco*, 1908; A. Bernard, *Le Maroc*, 1915; R. Kann, *Le Protectorat Marocain*, 1921; R. B. Cunningham Graham, *Mogreb-el Akksa: a Journey in Morocco*, 1928; H. Roberts, *History of French Colonial Policy, 1870-1925*, 1929; A. Bonnard, *Un Maroc* (7th ed.), 1931; J. Célérier, *Le Maroc*, 1931; G. de Chavrorière, *Histoire du Maroc*, 1931; P. Desfeux, *Le Maroc*, 1932; R. Pinon, *Maroc*, 1935; E. F. Cruickshank, *Morocco at the Parting of the Ways*, 1935; C. V. Usborne, *The Conquest of Morocco*, 1936; Gen. J. Caloni, *La France au Maroc*, 1937; M. O. El-Hajoui, *Histoire diplomatique du Maroc*, 1937; O. H. Warne, *Present-day Morocco*, 1937; M. M. Knight, *Morocco as a French Economic Venture*, 1938; T. Thomasset, *Le Maroc*, 1940; and St. R. Taillandier, *Le Maroc*, 1940.

Morocco, or Marrakesh, old cap. of the Moorish empire, on the N. side of the Great Atlas range, 90 m. from the Atlantic coast and 250 m. S.W. of Fez; has mounds, of carpets and leather, and is the centre of the trade of S. M. The city was founded in 1072, and had a pop. of 700,000 in the fourteenth century, which has now declined to about 190,000.

Moron, tn. of Cuba, W. Indies, 250 m. E.S.E. of Havana. Pop. 10,000.

Moron (Gk. μωρός, stupid), term applied to the highest grade of mentally defective person, those whose 'mental age' is somewhere between seven and twelve years. The M. is able to transact work requiring rational judgment, but in social matters he is largely dependent on the help or guidance of other people. Such

mental defectives may often be educated in special schools for simple employment, where they can be kept under observation with respect to their social and moral qualities.

Moron de la Frontera (anc. Aruml), tn. of Seville, Spain, 32 m. S.E. of Seville. The dist. is noted for its marble and chalk. Olive oil is produced. Pop. 18,700.

Moroni, Giambattista (1510-78), It. painter, b. at Bondo, Bergamo; studied under Moretto. He was especially successful in portrait-painting, and was praised by Titian. Five of his works are in the National Gallery, London, including the excellent 'Tallor.'

Morosini, illustrious Venetian family, probably of Hungarian origin. Among the most famous members were *Domenico M.* (doge, 1148-56), who recaptured Pola and other Istrian tus. from the Dalmatian corsairs; *Marius M.* (doge, 1219-52), who introduced the Inquisition into Venice; *Michele M.* (doge, 1382), a celebrated financier; *Andrea M.* (1558-1618), who became historiographer to the republic (1598), was one of the Council of Ten, continued Paolo Paruta's *Annali Veneti*, and wrote a hist. of Venice (1521-1615, pub. 1623) and other works; and *Francesco M.* (1618-94), a great sea captain, who became doge in 1688.

Morpeth, municipal and parl. bor. of Northumberland, England. 14 m. N. by W. of Newcastle. It has remains of a medieval castle and gateway; the par. church of St. Mary dates from the fourteenth century. There are large collieries in the neighbourhood, also iron foundries and quarries. In the tn. are breweries, corn mills, and flannel factories. M. has one of the most important cattle markets in the N. of England. Pop. 16,000.

Morpheus (from Gk. *Mopph*, form), in classic mythology, the son of Sleep and Night; the god of dreams, and creator of the visions of the sleeper.

Morphia, popular name for the alkaloid morphine, $C_{17}H_{19}O_3N$. Morphine is contained in opium or the juice of poppy-heads (*Papaver somniferum*). The opium extract is boiled with milk of lime and the product filtered. Morphine is contained in the filtrate, all other alkaloids being precipitated. After digesting the filtrate with ammonium chloride to remove all trace of lime, the separate morphine is collected and recrystallised from boiling alcohol. Morphine forms colourless prisms with one molecule of water of crystallisation; it is only slightly soluble in water and in cold alcohol, and on this account is used in medicine in the form of its salts, particularly the hydrochloride. Morphine is the most effective anodyne known to science, relieving pain and producing sleep either when administered by the mouth or injected hypodermically. One grain of the hydrochloride may be a fatal dose, but persons habituated to its use are capable of taking more than 15 grains a day. The effects of the M. habit are moral degeneration, disturbance of secretions, lowering of physical and mental powers. The habit is most difficult to break, owing to the moral weakness of the

victim; the sudden withdrawal of the drug is highly dangerous, and the only cure is the gradual diminution of the dose under circumstances which render it impossible for the patient to obtain more than his allowance. Various derivatives of morphine also find application in medicine, particularly diacetylmorphine hydrochloride (heroin), which acts as a repressant to the respiratory centres and is used to relieve cough; but as an analgesic it is inferior to morphine. Two other related alkaloids occur in opium: codeine (see CODEIA or CODEINE) and thebaine, the former being a mild narcotic, the latter a violent tetanising poison. The chemical constitution of M. was finally estimated in 1925 by Sir Robert Robinson.

Morphology concerns itself only with the analysis of any organism into its parts, and is not concerned with the life which produced, or is possessed by, that organism. Thus M. is that sub-science of biology which deals with the study of form or structure of the organism, as opposed to physiology, which is concerned with the functioning of those parts described by M. Expressed in another way, M. is the 'statics' and physiology the 'dynamics' of the organism. The scientific study of the form of an organism cannot be completed merely by description. Such phenomena as those of the development of form in the individual, and the presence of similar forms in different individuals, must be considered before the M. of an organism can be elucidated. Thus M. is intimately associated with embryology, in so far as the disposition of tissues is concerned, and with comparative anatomy. Some descriptive M. is found in anc. Egyptian, Babylonian, and Chinese records. Aristotle compared man with a quadruped; Hieronymus and Fabrarius (1537-1619) compared and contrasted the structure of certain mammals, and Pierre Belon (1551) made an important advance in extending his investigations to birds and fishes. Giulio Casserio (1561-1616) contributed to M. by comparing the ear ossicles of several mammals and the goose. Considerable progress in the science was made towards the end of the eighteenth and in the early nineteenth centuries. Goethe, Huxley, and particularly Haeckel, advanced M. by the formulation of synthetic views. Goethe (1790) in his *Metamorphosis of Plants* stated cotyledons, subsequent foliage leaves, and floral leaves were equivalent structures, and this was confirmed. Goethe also showed that, contrary to the general belief at that time, the human skull resembled that of other mammals in possessing a premaxillary bone. He strongly believed in 'unity of plan,' and to this conception St. Hilaire (1818) added the 'principle of connections,' viz. that similar parts occupy similar relative positions in all animals. The study of M. involves the recognition of homology as distinct from a 'logie.' This was emphasised by Owen (1843). Corresponding parts developing in similar ways may have very different ultimate forms and

functions, but nevertheless are homologous. Petals and foliage leaves of delphinium, the human arm and the wing of a bird, are examples of homologous organs. The leaf-like stem of *Ruscus aculeatus* and the leaf of smilax, insects' and birds' wings, are merely analogous, for their modes of development and the relation they bear to associated parts are entirely different. Although homology does not necessarily imply relationship, Haeckel and Gegenbaur regarded it as indicating common descent, and this view is held by most biologists. That branch of M. which traces descent by means of homologous characters Haeckel distinguished as phylogeny. As a result of embryological homologies discovered by von Baer, Haeckel formulated his 'Biogenetic Law of Descent,' generally spoken of as the 'Recapitulation Theory,' which states that the development of the individual organism recapitulates the course of its evolution; this theory is now accepted with considerable reservation since many features of an embryo obviously have no evolutionary significance. Thus M., from its apparently insignificant beginnings, has developed into the key-stone of evolutionary biology. See also ANATOMY; BIOLOGY; CELL THEORY; EMBRYOLOGY; HISTOLOGY; HOMOLOGY; PHYSIOLOGY. See E. S. Russell, *Form and Function: a Contribution to the History of Animal Morphology*, 1916; A. Meyer, *Lopik der Morphologie im Rahmen einer Logik der gesamten Biologie*, 1926; E. G. Conklin, *A Synopsis of the General Morphology of Animals*, 1927; W. B. Crow, *Contributions to the Principles of Morphology*, 1929; J. T. Saunders and S. M. Manton, *A Manual of Practical Vertebrate Morphology*, 1931; D'Arcy W. Thompson, *On Growth and Form*, 1917, 1942; G. Müller, *Die Gestaltfrage in der Literaturwissenschaft und Goethes Morphologie*, 1944; and Sir A. Keith, *Human Embryology and Morphology*, 1949.

Morphy, Paul (1837-81), Amer. chess player. See under CHESS.

Morris, Sir Edward Patrick (1859-1935), first Baron, Newfoundland statesman, b. at St. John's, and educated at Bonaventure College, St. John's, and univ. of Ottawa. He became a solicitor of the supreme court in 1884, and was called to the Bar in 1885. He sat in Parliament for St. John's, 1885-1919. In 1889 he became a member of the Cabinet, but left his party on the vote for the Reid railway contract, which he was mainly instrumental in carrying. He was leader of the Independent Liberal party, 1898-1900, but held a seat in the Cabinet 1900-7. In 1905 he became leader of the People's party. Attorney-general and administrator of justice, 1902-7. Premier of Newfoundland, 1909-18. P.C., 1911. He represented Newfoundland at the Imperial Defence Conference in 1909, at the Imperial Conference and the coronation in 1911, and at the Imperial War Conference, 1917. He was a member of the Brit. War Cabinet, Feb.-June 1917. He ed. the Newfoundland law reports, 1880-1905, cited as *Morris's Reports*.

Morris, Gouverneur (1752-1816), Amer. diplomat and statesman, b. in New York. Called to the Bar in 1771. He had joined the patriotic party by 1775, and sat in the Continental Congress, 1777-80. He became assistant-financier to Robert Morris (1781-85), after publishing a series of essays on Amer. finances in the *Pennsylvania Packet* (1780), and practically founded the national coinage. M. helped to draw up and revise the document setting forth the U.S. constitution (1787). He then travelled in France, England, and Germany, becoming minister to France from 1792 to 1794. He was elected U.S. senator for New York (1800-3), and chairman of the Erie Canal Commission (1810). See J. Sparks, *Memoirs of Gouverneur Morris, with Selections from his Papers*, 1832; E. Duyckinck, *Cyclopaedia of American Literature* (vol. I), 1855, and Anne Cowley Morris (ed.), *The Diary and Letters of Gouverneur Morris*, 1888. See also life by T. Roosevelt (Amer. Statesmen Series), 1888.

Morris, Sir Lewis (1833-1907), Brit. poet, great-grandson of the Welsh poet, Lewis M. (d. 1765). He graduated from Oxford (1855), and was called to the Bar at Lincoln's Inn in 1861, practising till 1881. Always interested in higher education in Wales, he became deputy-chancellor of the univ. of Wales, and served on the governing bodies of the three Welsh colleges. His works include *Songs of Two Worlds* (1871-75); *The Epic of Hades* (1875-77, which went through numerous eds.); *Gwen, a Drama in Monologue* (1879); *The Ode of Life* (1880); *Songs Unsung* (1883); *Songs of Britain* (1887, containing odes on the queen's jubilee and the foundation of the Imperial Institute); *Idylls and Lyricks* (1896); *The Harvest-tide* (1901); and *The New Rambler: from Desk to Platform* (1905). A collection of his works appeared in 1882 (revised 1907). M. was made a knight of the order of the Savour (of Greece) in 1879, and awarded a jubilee medal (1887).

Morris, Richard James, see ZADKIEL.

Morris, William (1834-96), Eng. poet and artist, b. at Walthamstow, Essex. He was educated at Marlborough and at Exeter College, Oxford. At the univ. he read widely, and began his friendship with Edward Burne-Jones. M. was one of the originators of the *Oxford and Cambridge Magazine* (1856), to which he contributed short stories, essays, and poems. In 1858 he pub. a book of verse, *The Defence of Guinevere*, but at this time his interest was inclining to painting and illuminating. He married Jane Burden in 1859, and built a house at Upton for himself, for which he designed the decorations. It was probably this that gave him the idea of forming (1861) a firm of manufacturers and decorators, known as M., Marshall, Faulkner & Company, the main object of which was to produce artistic furniture and to undertake artistic furnishing.

In 1868 he began to write *The Earthly Paradise*, which he completed in 1870. After this was pub. M. turned his attention to illuminated MSS., and later studied the arts of dyeing and

carpet-weaving. In the early eighties he embraced socialistic tenets. In 1890 he started at Hammersmith the Kelmscott Press (so called after his house near Lechlade, which he had leased in 1871), and thence issued the magnificent and much-sought-after books. It is difficult to over-estimate the great influence that M. has had on book production. Although his direct influence is somewhat decried at the present time, it is undeniable that the form of the better class modern book owes a debt to the impetus given by M.

His first vol. of verse, *The Defence of Guenerere* (1858), was the earliest manifestation of what is called the second romantic revival, of which he and Rossetti were the leaders. Both writers were drawn to medieval sources, as were their early nineteenth-century predecessors, but they used those sources in a novel and much more scholarly manner, and in some sort seemed to succeed in reviving the sentiments and modes of thought of the Middle Ages. Yet M.'s *The King's Dream*, *Haystack in the Floods*, *Sir Peter Harpton's End*, and *Shameful Death* all show that he realises the savage element in the Middle Ages which he is far from representing as a past golden age of prosperity and bliss. In *The Life and Death of Jason* (1867), *The Earthly Paradise* (1868-70), and *Lore is Enough* (1871) there is an even flow of narrative, if somewhat diffuse and monotonous in general effect. Both the two former of these works contain a memorable envoi to Chaucer, and the scheme of *The Earthly Paradise* is so conceived that M. can select from all the great stories of the world's literature, classical, medieval, or oriental, and clothe them in medieval dress. *Lore is Enough* is a well-constructed mystery play. *Sigurd the Volsung* (1876) is an ambitious version of Scandinavian legend, reproducing the wild spirit of Norse poetry and the austere passion of N. sagas. M.'s theory of art may be briefly mentioned. Like that of his master, Ruskin, it was one with a very practical bearing on the conduct of life. The key to his position in this regard is to be found in his own words: 'That thing which I understand by real art is the expression by man of his pleasure in labour' (*Lectures on Art*). M. believed that all creative work whatsoever ought to be artistic so as to produce the pleasure that comes from the healthy exercise of man's energies and 'appeals to his emotions and his intellect by means of his senses.' To M. the greatest happiness is happy work, and the greatest sin, the sin against beauty of life, thought, or natural environment. Among his other writings were long, verse trans. of the *Aeneid* (1875) and the *Odyssey* (1887); *The House of the Wolfings* (1889); and *News from Nowhere* (1891). A collected ed. of his works, with introductions by May M., was publ. 1910-15. See lives by A. Vallance (with bibliography), 1897; J. W. Mackall, 1899; Holbrook Jackson, 1908; J. Drinkwater, 1912; A. Compton-Rickett, 1913; G. D. H. Cole (in *Rervaluation*), 1931; P. Bloomfield, 1934; Esther Meynell, 1948; and E. and S. Godwin *Warrior Bard*, 1948; also B. I. Evans,

William Morris and his Poetry, 1925; F. L. Lucas, *Eight Victorian Poets*, 1930; and A. D. M. Hoare, *The Works of Morris and Feats in Relation to Early Saga Literature*, 1937.

Morris, William Richard, see NUFFIELD, FIRST VISCOUNT.

Morris (Morrice, Maurice, Mores) Dance, O.E. dance probably of Moorish origin, and most likely introduced into England by Eleanor of Castile, queen of Edward I. In Henry VIII.'s reign it formed an essential part of most rustic and parochial festivities. When later it was associated with the May games, the dancers frequently represented characters of the



MORRIS DANCERS
At the English Folk Dance Society's annual festival at Caerleon

Robin Hood legend, especially Maid Marian and Friar Tuck. The hobby-horse was at one time a prominent figure in this dance. It was suppressed by the Puritans and never generally revived. See J. Strutt, *Sports and Pastimes*, 1810; J. Brand, *Observations on Popular Antiquities*, 1813; F. Douce, *Illustrations of Shakspeare* (vol. II.), 1839; C. Sharp and H. MacIlwaine, *The Morris Book*, 1907; J. H. Crampton, *Folk Dance Book*, 1940; V. Alford, *Peeps of English Folk Dances*, 1940; D. Kennedy, *England's Dances: Folk Dancing To-day and Yesterday*, 1948; and also *The Journal of the English Folk Dance Society*.

Morris Motors Limited, important motor-car manufacturing company, which was registered June 29, 1926, as having acquired the businesses of a previous company of the name of Holliek and Pratt Ltd. and Osberton Radiators Ltd. The business is the outcome of the remarkable capacity, inventiveness, and organising skill of its chairman, Lord Nuffield, who, from small beginnings at a little workshop he started at the age of seventeen, developed the great factory at Cowley in Oxfordshire. The works cover 82 ac., with an ann. output capacity exceeding

100,000 cars. The authorised capital of the company is £5,650,000, viz. £2,650,000 in ordinary and £3,000,000 in 7½ per cent cumulative preference stock. No prior or *part passu* shares can now be issued without the consent of the preference stockholders. The company controls Morris Commercial Cars Ltd.; Nuffield Acceptances Ltd.; Nuffield (Australia) Pty. Ltd.; Nuffield Exports Ltd.; Nuffield Mechanisations Ltd.; Nuffield Metal Products Ltd.; Nuffield Tools and Gauges Ltd.; Riley Motors Ltd.; The M.G. Car Company Ltd.; The Nuffield Press Ltd.; The S.U. Carburettor Company Ltd.; and Wolseley Motors Ltd.

Morrison, Arthur (b. 1863), Eng. novelist and writer on art. His best stories are *Tales of Mean Streets* (1894); *A Child of the Jago* (1896); *The Dorrington Deed-box* (1897); *The Hole in the Wall* (1902); *Green Eye of Goona* (1904); *Green Ginger* (1909); *Fiddle o' Dreams* (1933); and a series of detective stories centred on the fictional character, Martin Hewitt, investigator. He wrote also *The Painters of Japan* (1911), and other books on oriental art. Co-author of the plays *That Brute Simons* (1904); *The Dumb Cake* (1907); and *A Stroke of Business* (1907).

Morrison, George Ernest (1862-1920). Australian explorer and journalist; b. at Geelong, Victoria; son of a Scotsman, principal of Geelong College. He left Melbourne Univ. at eighteen and became a wanderer. He visited South Sea Is. as a common sailor, 1882, and pub. observations on forced labour there in *Melbourne Age*. In the same year he crossed Australia N. to S. In New Guinea he was nearly murdered by natives. M.D., 1887. He visited U.S.A., W. Indies, Spain, and Morocco. In 1890 he went to Ballarat and was for two years in charge of the hospital. He crossed from Shanghai to Rangoon by land, 1894. In 1895 he became correspondent of *The Times* in China and Siberia, and in Peking during siege of the legations, 1900. In 1907 he crossed China, Peking to Tonquin, and in 1910 rode from Honan to Russian Turkestan.

Morrison, Herbert Stanley (b. 1883), Eng. statesman. He was educated at an elementary school in London, and later was a shop assistant, a telephone operator, and a deputy newspaper circulation manager. In 1915 he became secretary of the London Labour party, holding office until 1940. Entering local government M. was mayor of Hackney, 1919-20, and, in 1922, became Socialist leader in the L.C.C.; an alderman from 1931, he was leader of the council from 1939 to 1940. His first appearance in national politics was in 1923, when he became M.P. for S. Hackney. He lost this seat in 1924, but regained it five years later, becoming minister of transport in Macdonald's minority gov. until the Labour defeat of 1931. Concentrating upon local government M. was responsible for the legislation setting up the London Passenger Transport Board. Returning to Parliament in 1935 he became minister of supply in the wartime Coalition Gov. in 1940, but soon exchanged that post for the Home Office

and the Ministry of Home Security. From 1942 to 1945 he was a member of the War Cabinet. In the third Labour gov. of 1945 M. became leader of the House of Commons and lord president of the council. Besides being an administrator of ability he is an original thinker on the problems of socialism and the Labour party, tending rather to the old tradition of Eng. Radicalism than to doctrinaire Marxism. He has written *Socialisation and Transport* (1933); *How Greater London is Governed* (1935, 1949); *Looking Ahead* (1943); and *The Peaceful Revolution* (1949), a collection of speeches. See life by M. Edelman, 1948.

Morrison, Robert (1782-1834), Brit. missionary, founder of Protestant missions in China, b. at Morpeth. He studied in England from 1801 to 1807, when he was sent to Canton by the London Missionary Society. In 1809 he became translator to the E. India Company. He estab. an Anglo-Chinese college at Malacca in 1818. He trans. the Bible into Chinese (1809-1819), and compiled a *Dictionary of the Chinese Language* (1815-23); *Chinese Grammar* (1815); and *Chinese Miscellany* (1825).

Morriston, riv. of Ross and Cromarty and Inverness, Scotland. Its source is near Loch Cluny, and it flows into Loch Ness at Invermorriston in Inverness. Length 19 m.

Morristown, co. seat of Morris co., New Jersey, U.S.A., on Whippoor R., 26 m. W. by N. of New York. It is a favourite summer and health resort. Pop. 15,000.

Morrow, Dwight Whitney (1873-1931). Amer. diplomat and banker. He was a member of J. P. Morgan & Company (q.v.), from 1914 to 1927; chairman of the Prison Inquiry Commission, New Jersey, 1917, and of the New Jersey State Board Institutions and Agencies until 1920. He was advisor to the Allied Maritime Transport Council, 1918. D.S.M., 1919. He became chairman of the President's Aircraft Board in 1925, and was ambas. to Mexico from 1927 to 1930. He was successful in bringing to an end the tension between Mexico and the U.S.A., and in establishing an era of better feeling. He was one of the U.S. delegates to the London Naval Conference in 1930 and, later, was elected to the U.S. Senate as a Republican from New Jersey. See life by H. Nicolson, 1949.

Mors, or Morso, is. of Denmark, off the W. coast of Jutland, in the Lim Fjord. Chief tn. is Nykjobing. Length 22 m. Pop. 18,500.

Mors, tn. in the Rhineland prov., Germany, 17 m. W. of Essen, with coal-mining and iron foundries. Pop. 24,000.

Morse, Samuel Finley Breese (1791-1872), Amer. inventor of telegraphic system, b. at Charlestown, Massachusetts. In 1811 he came to England to study art under West, and gained a gold medal in 1813 for a statue. He returned to America in 1815, and was first president of the National Academy of Design, New York, during 1826-42. He also studied chem. and electricity, and in 1832 conceived the idea of a magnetic telegraph.

The original M. code (*see under TELEGRAPHY*) was devised in 1837 with Alfred Vail and introduced by M. for use with a self-recording telegraph. In 1843 Congress granted \$30,000 for an experimental telegraph line between Washington and Baltimore, and M.'s system was soon widely adopted. *See life by S. I. Prime, 1875, and E. S. Morse (ed.), Letters and Journals, 1914.*

Morse, see WALRUS.

Morse Code, see TELEGRAPHY. Morse System.

Morshansk, tn. in the Voronezh Region of the R.S.F.S.R., 58 m. N.E. of the city of Tambov. It is a trade centre for wheat grown in Tambov, Penza, etc. The manufus. include glue, tallow, soap, and malt. Pop. 30,000.

Mortain, vil. in the dept. of Manche, France, 20 m. W.S.W. of Avranches. For details of the fighting here during the Second World War *see under FALAISE, Battle of the Falaise Pocket.* Pop. 1707.

Mortality.—The Law of Mortality. In actuarial calculations the law which, founded on the average M. for any given number of years, determines the proportion of persons who die in any assigned period of life or interval of age out of a given number who enter upon the same interval.

Bills of Mortality.—Abstracts from par. registers giving the number of persons that have died in any par. during certain periods of time, and denominated according to the period taken, weekly, monthly, or yearly bills. They originated in London in the sixteenth century, during the time a plague epidemic was ravaging the city, and have been pub. regularly from shortly after that year till the present time. *See also BILL OR MORTALITY.*

Mortality, Bill of, see BILL.

Mortar (Lat. *mortarium*), material used to bind together the bricks and stones of a building. The use of such a material dates back to early times. M. is a mixture of lime with water and sand. The sand is placed on the mixing platform and formed into a ring, into which the required quantity of lime is placed. The whole is then well sprinkled with clean water, the sand turned over the lime, and it is left to 'shake' for a day or two, when it is well mixed up. It is preferable to leave the M. for some time after mixing, until it is 'tempered.' 'Hydraulic mortar' is a name sometimes given to M. which hardens in water (as opposed to ordinary M., which hardens only in air), but this is really cement (q.v.).

Mortar, short piece of ordnance with a very wide smooth bore, the width of which in early pieces equalled the length of the M. It was formerly employed against forts during sieges owing to its power to develop high angle fire. Before the First World War Ms. were heavily constructed and unsuitable for field work, but during the war a light portable pattern was invented (the Stokes M.) which could develop an accurate destructive fire at short range. In trench warfare such a weapon was invaluable against hostile machine-gun emplacements, snipers'

posts, or any construction in the front line which could not be destroyed by rifle fire. As they must be well to the front to be of service, their ammunition supply became one of difficulty. In the Second World War Ms. were extensively used as an infantry support weapon. Besides the 2-in. M., throwing a bomb about the size of a hand-grenade, Brit. battalions in the Second World War included in their support company a M. platoon armed with 3-in. Ms. which were carried in Bren-carriers. As pieces of this calibre could conveniently be broken down into loads for one pack animal, they were extensively used in int. warfare. Their high trajectory permitted their use in wooded country where the problem of crest clearance could not be surmounted by light artillery at short range, and on the N. sectors of the Russian front they tended to replace the light field gun as a close-support weapon. As a result of experience by both sides in this theatre heavier models were developed, of which the Finnish Tampela (120 mm.) M. was one of the first. This and similar weapons up to 150 mm. had a round instead of a square baseplate with detachable wheels and could be towed like a field-gun, but muzzle foremost. Owing to their smooth bore and less complicated recoil mechanism, Ms. could be more speedily and cheaply manufactured than field guns, and besides were well suited for transport by air. In the Ger. Army, handicapped by its insufficient estab. of artillery, Ms. tended more and more to replace the infantry support gun, especially in airborne divs. This led in the Brit. Army to the development of a counter-M. organisation at brigade level. A 4.2-in. M. was used in the N. African campaign, with a range of over 2000 yds. and a 20-lb. bomb. In the Normandy landings 6-in. Ms. were mounted on tanks. At the end of the war the U.S. army was testing a self-propelled M. firing a 2-ton projectile 4 m.

Mortara, tn. of Italy in the prov. of Pavia, 25 m. S.W. of Milan. The Austrians gained a victory over the Sardinians here in 1849. It is a railway junction, and has iron works. Pop. 11,000.

Mortar and Pestle. M. is a vessel in which substances are ground to fragments or pulverised by beating with an instrument called the pestle. They are made of various substances according to their use. Glass, agate, flint, porphyry, stone-ware, or cast-iron is generally used. Glass and stoneware Ms. are used in the laboratory for analytical work, agate is used when the substance is to be reduced to a very fine powder, whereas iron Ms. are employed for crushing coarser substances.

Mortehoe, vil. of N. Devon, 14 m. from Ilfracombe. The church has interesting carving and a good specimen of mosaic. Between M. and the sea is Morte Point, 1 m. N. of Woolacombe and 6 m. from Ilfracombe. Between Croyde, 11 m. from Ilfracombe, and Morte Bay are many acres of fine bold headland and agric.

land with splendid views of Morte Point, Kipling Tors, and Hartland Point. This land has been given to the National Trust. Near M. is the Full Point lighthouse, where mechanism for signalling both by light and sound is to be seen, notably the reflected red light on to the dangerous Morte Stone, where there are treacherous currents.

Mortgage, transfer of land or other property as security for the repayment of a loan. It is to be distinguished both from a hypothecation and a pawn or pledge. In hypothecation the creditor has rights over but does not take possession of the hypothecated property of his debtor. This latter term in Eng. law is practically confined to a master's (*q.v.*) power to raise money on his ship or cargo for necessary purposes (*see also BOT-TOMRY*), but is a common form of security in Scots law (*see HYPOTHEC*). In the case of a pledge of goods, possession is given to the pawnee, and herein it differs from a true M. of chattels by bill of sale (*q.v.*). Under a bill of sale to secure a debt, the property in, but not the possession of, the scheduled goods and chattels passes to the grantee, subject either to a condition cancelling the transfer on performance of the condition to repay the loan with interest, or to a proviso enabling the grantor (debtor) to redeem his property by such payment and at once to have it reconveyed to him.

Mortgage of Land.—A *legal* as distinct from an *equitable* M. (*q.v.*) is created by a deed (*q.v.*) conveying the full ownership of the land comprised in it to the mortgagor, subject to the mortgagor's 'equity of redemption,' a right to have his land back again on payment of the principal money and interest. Most Ms. include an express covenant (*q.v.*) on the part of the mortgagor personally to repay the loan, but such covenant is obviously only useful where the mortgagor has money with which to repay, and generally speaking, the mortgagee sues on it only if the land becomes less valuable and insufficient to secure the loan. The rights of the mortgagee are: (1) To sue on the covenant to repay at any time after the expiration of the period (usually six months) fixed for payment. (2) To enter into possession of the land at any time; though usually the mortgagor is left in possession pending the necessity of realising the security. In any case, if the mortgagee goes into possession he will be called upon to account strictly not only for the rents and profits received by him, but for all he might have received if he had exercised the utmost care. When in possession he may make building leases for ninety-nine years, or occupation leases for twenty-one years. If he remain in possession for twelve years without acknowledging the title of the mortgagor, he becomes absolutely entitled to the land (*see LIMITATIONS, STATUTES OF*). (3) To apply after the expiration of the term for repayment, to the court for a *foreclosure* order, i.e. an order fixing a further period (generally six months) within which the mortgagor must pay the principal, interest and costs, or be for ever

foreclosed of his equity of redemption. (Under the Law of Property Act, 1925, the notice requiring payment of the M. money must be in writing.) (4) To sell the land, and out of the proceeds to recoup himself, the costs of the sale, the M. debt and interest, which right is less stringent than a foreclosure, because the mortgagor is entitled to the surplus proceeds. But there is no right to sell unless either (a) the mortgagee has given three months' notice in writing demanding payment and stating his intention to sell if the money be not paid; or (b) some interest is two months in arrear; or (c) there has been some breach of the covenants in the deed other than that for the repayment of the loan. A right to sell is implied in a M. deed, and therefore no order of court is required. (5) To appoint a receiver of the rents and profits to apply the same in payment of debt and interest. The mortgagor's rights are: (1) If in possession to make building and occupation leases for ninety-nine and twenty-one years respectively. (2) If he redeems, to get his land back free from all restrictions whatever. (3) If he remains in possession for twelve years without paying any part of the principal or interest, to ignore the mortgagee's rights. Any provision inserted in the M. to prevent redemption on payment or performance of the debt or obligation for which the security was given is termed 'a "claw" or "fetter" on the equity of redemption' and is void. No agreement between mortgagor and mortgagee contained in the M. can make the M. irredeemable, and no contract at the time of the M. and as part of the M. transaction, or, as one of the terms of the loan, can be valid if it provides that the mortgaged property shall become the absolute property of the mortgagee upon any event whatsoever. Redemption may, however, be postponed for a reasonable time where there is a corresponding provision for the continuance of the loan, and there do not exist any circumstances which make the clause oppressive or unreasonable. The right of redemption continues unless and until by judgment for foreclosure, or the operation of the Statute of Limitations, the character of the creditor is changed for that of owner, or the interest of the mortgagor is destroyed by sale either under the process of the court or of a power in the M. incident to the security. The mortgagee has no right of foreclosure unless the contract contains a condition upon which a forfeiture results; for the court grants a foreclosure upon the principle that the mortgagor has broken a condition which forfeits his legal right to redeem. Thereupon, however, his equitable right to redeem arises, and foreclosure is the remedy by which that right is terminated. The right of a mortgagor to redeem on payment of principal and interest and costs, was, until the changes made by the Law of Property Act, 1925, not a mere right, but an equitable *estate or interest* in the property. But his right or equity of redemption is no longer an equitable estate or interest. Under the present system of creating legal Ms., the

mortgagor takes only a term of years, leaving the legal freehold reversion expectant on the M. term in the mortgagor. Thus the mortgagor retains his legal freehold estate and he cannot at the same time have an equitable estate co-extensive with it. Hence instead of his equity of redemption constituting an equitable estate, it subsists only as a right in equity to redeem the property, this right being attached to his legal freehold estate (and similarly in the case of a M. of chattels). A deposit of title-deeds as a security for a debt, without writing or by word of mouth, may create a charge upon the property notwithstanding the Law of Property Act, 1925, since the delivery of the deeds is sufficient part performance of the implied agreement to give a security. A deposit of title-deeds does not itself create a charge, and the mere possession of deeds without evidence of the contract under which possession was obtained, will not create an equitable security. Although there may have been no actual transfer of the M., a person who advances money for the purpose of paying it off, and whose money is thus applied, becomes an equitable assignee of the M., and is entitled to have it kept alive for his benefit. Mortgagors of houses to which the Increase of Rent and Interest Restriction Acts, 1920-33 apply are subject to restrictions under those Acts on the rate of interest and on the exercise of their remedies, including going into possession.

Welsh Mortgage. A Welsh M. is a practically obsolete form of security. It is an assurance by which, to receive a debt, the property is conveyed to the creditor without any condition for payment or proviso for reconveyance, the bargain being that until redemption the rents and profits are to be set off against the interest. A Welsh M. gives a right to redemption at any time on payment of principal and interest, but confers no power to compel redemption or to foreclose.

See R. H. Coote, *Law of Mortgages*, 2 vols. (6th ed., 1927), by R. L. Ramsbotham; W. R. Fisher and J. M. Lightwood, *Law of Mortgages* (7th ed.), 1931, with supplement, 1947; H. G. Hanbury and C. H. M. Waldoock, *Law of Mortgages*, 1938; and R. W. Turner, *Equity of Redemption*, 1931.

Mortification (physiology). see GAN-GRENE.

Mortification, Scots legal phrase applied to lands given for charitable or public uses. Ms. for the benefit of the poor generally fall under the administration of the heirs (q.v.) and Kirk session, while lands given for any charitable purpose are disposed to trustees to be held in banch or feu. The Court of Session has jurisdiction to control the management of the administration of Ms. M. is practically synonymous with Eng. mortmain (q.v.).

Mortimer, Roger, first Earl of March (c. 1287-1330). In 1304 he succeeded his father, Edmund M., the first baron by writ, as lord of Wigmore, and in 1306 was knighted. In 1316 he was appointed lieutenant of Ireland, and in 1317 drove

Brice to Currikergus, and defeated the Lays. He became justiciar of Ireland in 1319, fought for his uncle, Roger M. of Chirk, in Wales in 1320, and in 1322 was captured and sent to the Tower. He escaped to Paris in 1324, and became chief adviser to Queen Isabella. In 1327 he became justiciar of Wales. In 1330 he was accused of treason and complicity in the death of Edward II., and other charges, and executed at Tyburn.

Mortlake, vil. in Surrey, England, 6½ m. from London. The church of St. Mary the Virgin, founded in 1348, rebuilt in 1843, and often enlarged, contains memorials to Sir Philip Francis and Sir John Temple, besides many tombs of celebrities, notably of Dr. John Dee, philosopher and astrologer. The 'Ship Hotel' is notable as the finishing point of the annual boat race between Cambridge and Oxford Univs. Maltting is the local industry.

Mortmain. An alienation of land in M. or *in mortua manu* denotes the transfer of land into the dead hand either of the church or any other corporation (q.v.), and was so called from the fact that the immortality and other non-human attributes of corporations necessarily prevented the hands in their possession from ever being profitable either to the king or to the immediate feudal lords of those who had alienated them, because there was no possibility of escheat (q.v.), reliefs, wardships, marriages, or any other feudal aids. The Statute of Mortmain, 1279, prohibited the transfer of lands or tenements 'in such a way that such lands or tenements should come into mortmain.' The learning on the subject of M. is almost as purely antiquarian as that of feudal aids, but is still of some practical importance from the fact that though the same reasons do not now exist for prohibiting the conveyance of land to a corporation, and though there are numerous statutory provisions by which almost any corporation can hold land with or without a royal licence, the Mortmain Acts of 1279, 1391, 1888, are still in force. Early in the hist. of Eng. real property law, the conveyance of land was next to impossible, but even when most of the feudal restrictions on alienation had been abolished, it still remained, and in the theory of the common law still remains, impossible for a corporation to purchase land without a licence. The only justification for such a prohibition at the present day is the objection to perpetuities, or, in other words, virtual withholding of land from the open market. But at the present day numerous corporations can hold lands in M. without either a licence from the Crown or the authorisation of a public or private Act of Parliament. Every registered joint-stock company (incorporated under the Companies Consolidation Act, 1908, or the Acts consolidated in that Act) formed for the acquisition of gain may hold lands for the purposes of the business of the company; but no company formed to promote art, religion, science, or charity, or for a non-lucrative purpose, can hold more than 2 ac. of land without the sanction of the Board of Trade. Charity trustees

may be incorporated under the Charitable Trusts Acts, and may then hold lands without further licence. Under the Public Health Act, 1875, the Municipal Corporation Act, 1882, the Local Government Acts, 1888 and 1894, municipal corporations, co. councils, and other local authorities are empowered to hold lands for the purposes of those Acts. Any assurance of land, or personal estate to be laid out as land, for educational purposes is exempted from restrictions under the M. Acts. A local authority may accept land, money, or other property for the purposes of the Housing Act, 1936, and it is unnecessary to enrol any assurance of it under the Mortmain and Charitable Uses Act. A joint board for the purposes of the Public Health Act, 1936, is empowered to hold land for the purposes of their constitution without licence in M. Railway, gas, water, and tramway companies could also hold land under their respective private Acts.

Under the Mortmain and Charitable Uses Act, 1888, every conveyance of land, or grant of money to be laid out in land, for charitable uses (q.r.) is forbidden, unless (1) made by deed executed in the presence of two witnesses and enrolled in the central office of the supreme court within six months after execution, except in the case of copyhold land or stock in the public funds; (2) made at least twelve months, or, if stock in the public funds, 18 months before the death of the grantor; (3) the assurance takes effect in possession without power of revocation or condition in favour of the grantor except a reservation of mines, easements, nominal rent, and repairing covenants. If, however, the assurance is made *bona fide* and for valuable consideration (q.r.), (1) and (2) do not apply. There are exemptions from the above restrictions in the case of Oxford, Cambridge, London, Durham, and Victoria Univs., and in favour of gifts not exceeding 20 ac. to public parks, 2 ac. to museums, and 1 ac. to elementary schools. By the Mortmain Act, 1891, *any devise* to a charity is good, but the land must be sold within a year after death of the testator unless the court otherwise orders. See Sir W. Holdsworth, *History of English Law*, 1922-38, and *Historical Introduction to Land Law*, 1927; G. C. Cheshire, *The Modern Law of Real Property*, 1925, 1945; and H. M. Chew, *English Ecclesiastical Tenants-in-chief and Knightservise*, 1932 (thirteenth to fourteenth centuries).

Morton, Henry Canova Vollam (b. 1892), Eng. journalist and author, entered journalism in Birmingham in 1910, and has since been connected with leading London daily newspapers in an editorial capacity and as a contributor. He made his reputation as an author with a number of books about London and the Brit. Isles, based on a close knowledge and regard for present customs, traditions, and hist. *The Heart of London* appeared in 1925 and *In Search of England* in 1927, followed by similar books on Scotland (1929), Ireland (1930), and Wales (1932). His travels in the Holy Land were recounted in the successful *In the Steps of The*

Master (1934); *In the Steps of St. Paul* (1936); and *Through Lands of the Bible* (1938). He has also written *In Search of South Africa* (1948).

Morton, James Douglas, fourth Earl of (d. 1581), regent of Scotland. In 1557 he subscribed the first bond of the Scottish reformers, but withdrew his support in 1559. When Mary Queen of Scots arrived in Scotland he became privy councillor. He was instrumental in suppressing Huntley's conspiracy in 1562, and was made lord chancellor in 1563. He offered no opposition to the marriage of Mary with Darnley, instigated the murder of Rizzio, and joined Ruthven and Hamilton in settling the crown matrimonial upon Darnley. In 1566 Darnley denounced him and he was obliged to flee, but later in the same year was pardoned through the influence of Bothwell, for whose marriage with Mary he signed a bond in 1567. He then roused the citizens of Edinburgh against Bothwell, but allowed him to escape, and brought about the queen's imprisonment at Lochleven. He became lord chancellor and a member of the Council of Regency, in which capacity he acted as adviser to Moray, and practically ruled the country during Lennox's regency. He gained the favour of Elizabeth, and induced many prominent men to desert Mary's cause. In 1578 James VI. assumed the gov., but a Parliament held at Stirling Castle re-estab. M. at the head of affairs. He was executed in 1581, having been convicted of the charge, brought by the earl of Lennox, of being privy to Darnley's murder.

Morton, John (c. 1120-1500), Eng. ecclesiastic, b. in Dorset; master of the rolls from 1473; bishop of Ely, 1479. Imprisoned by Richard III., he was taken into favour by Henry VII., and made archbishop of Canterbury in 1486 and lord chancellor in 1487. His ingenuity in extracting 'benevolences' from both the ostentatiously wealthy and the parsimonious originated the proverbial phrase of 'M.'s fork.'

Morton, John Cameron Andrieu Bingham Michael (b. 1893), Eng. author and journalist; contributor to the *Daily Express* since 1924 under the pseudonym 'Beachcomber.' He has pub. a number of books of fantasy, satire, humour, and parody, including *Morton's Folly* (1933); *Gallinaufry* (1936); *Sideways through Borneo* (1937); and *Fool's Paradise* (1941). His historical writings include *Sobieski. King of Poland* (1932); *The Bastille Falls, and other Studies of the French Revolution* (1936); *The Dauphin* (1937); *Saint-Just* (1939); and *Brumaire: the Rise of Napoleon* (1948).

Morton, John Maddison (1811-91), Eng. dramatist, b. at Pangbourne, Berkshire. His works, mainly farces and often adapted from the Fr., were very popular, and included *My First Fit of the Gout* (1835); *Grimshaw, Bagshaw, and Bradshaw* (1842); *To Paris and Back for Five Pounds* (1850); *Bos and Cox* (1847); and *Going It at Toole's Theatre* (1885). See life by C. Scott, 1886.

Mortsel, tn. in Belgium and suburb of

Antwerp, 5 m. to the S.E., engaged in market gardening, breweries, and manufs. of photographic material and iron goods. Pop. 16,400.

Mortuary. A local authority may provide and fit up a proper place for the reception of dead bodies, make by-laws with respect to the management, and charges for the use of the same, and provide for the decent and economical interment of the dead bodies received into any such M. If a local authority do not provide a M. voluntarily, the Ministry of Health has power to require them to do so. The local authority may also provide a post-mortem examination chamber, which, however, must not be at a M. Co. councils have concurrent powers to establish M.s for the reception of unidentified dead bodies, and to require bor. councils to provide post-mortem chambers. Any local authority having power to provide a M. may purchase by agreement, or by compulsion, or take on lease, any land or buildings they may require for a M. See BURIAL ACTS.

Morvi, small state of Kathiawar, Bombay, India. Area 821 sq. m. Pop. 104,000. The tn. is 110 m. S.W. of Ahmadabad. Pop. 16,500.

Moryson, or Morison, Fynes (1566-c. 1630), Eng. traveller. He visited Germany, the Low Countries, Poland, Italy, Switzerland, and France (1591-95), and Palestine, Constantinople, and Scotland (1598). In 1600 he went to Ireland, became secretary to Sir Charles Blount, and helped to suppress Tyrone's rebellion. See his hist. of Tyrone's rebellion and account of his travels, pub. 1617.

Mosaic, variety of surface decoration, used largely on floors and walls. In M. work variously coloured fragments of marble, glass, ceramic, or other substances are arranged in a cement or mastic bed so as to produce an artistic or geometrical design. The art goes back to a very remote origin, but it reached its highest development in ant. times among the Romans. Very few old Rom. villas remain in which there is not some M. work of a greater or less degree of elaboration. The best-known example is that of Hadrian's villa at Tivoli, where Pliny's doves are represented with wonderful delicacy of colouring. The tesserae (the small fragments of which the M. is composed) have varied considerably in size at different times. The Rom. tesserae measured from a quarter to half an inch in size, but those used in the later fourteenth-century It. work were frequently under one-eighth of an inch. M. work became a special feature of Christian churches under the Byzantine empire, and E. influence is clearly to be seen in the Rom. work. In the E. the art continued down to the thirteenth century. In the W. it declined in the seventh century, revived again in the eighth for about a century, but then, fell away again until the fourteenth century. In modern times the art seems to have been well preserved only at Venice, though Eng. examples exist in St. Aidan's Church, Leeds, Westminster Cathedral, and St. Paul's Cathedral. See

A. Salvati, *On Mosaic*, 1862; F. Winter, *Alexander Mosaik*, 1909; M. Avi-Yonah, *Mosaic Pavements in Palestine*, 1935; Ricarda Huch and W. F. Voibach, *christliche Mosaik*, 1943; and D. Levi, *Antioch Mosaic Pavements*, 1948.

Mosaic Gold consists of stannic sulphide (Sn_2S_3). It is prepared by heating together a mixture of very finely divided tin with sulphur and ammonium chloride. It is obtained in golden spangles, and it is used extensively for imitation gilding.

Mosaylima, or **Moseilema**, contemporary and rival of Mohammed (*q.v.*), claiming to have equal rights with him to the title of 'Messenger of God.' He stated that Mohammed had nominated him his successor, but his claim was not acknowledged by the Muslims. He was killed in 643 by Khalid, a general of Abu Bekr.

Moscheles, Ignaz (1794-1870), Bohemian pianist and composer, b. at Prague, of Jewish parents. In 1820 he toured Germany, Holland, France, and England, giving concerts, and in 1825 settled in London as prof. at the Academy of Music and director of the philharmonic concerts. He gave lessons to Mendelssohn in Berlin in 1824 and became his life-long friend. In 1844 he, together with Mendelssohn, became leader of the Leipzig Conservatoire. He composed about 110 opus numbers, including piano concertos, sonatas, chamber music, three *Allegri di Bravura* and studies for pianoforte. He was a gifted improvisator and the inventor of the 'singing tone,' later developed by the Liszt school. See life by his wife (Eng. trans. 1873), and his correspondence with Mendelssohn, pub. 1888.

Moschus, Gk. bucol. poet, was a native of Syracuse, and fl. in the second or third century B.C. Nothing is known of his life. His works are generally printed together with those of Theocritus and Bion. Only four *Idylls* and some fragments are extant, all but one written in the Doric dialect, and remarkable for their beauty. They have been trans. into Eng. prose by Andrew Lang (1889).

Moscow: 1. The M. Region of the R.S.F.S.R. lies immediately S. of the Tver and Vladimir Regions. Area 13,000 sq. m. The surface of the dist. is level with the exception of a tract in the S.W. which is elevated. It is watered by the Moskva and the Kluzhma, while the Oka forms a portion of its S. boundary. The soil, principally clayey, with some sandy and stony tracts, is on the whole unfertile, and insufficient to supply local consumption. Sown grasses form an important part of the agric. economy of the region, as also does dairy farming, which in Russia is concentrated in the damper and formerly forested areas. Pig-rearing is well developed, the chief source of fodder being the potato, and many state farms specialise in the breeding of both pigs and cattle. Few of the dists. or regions of Russia, however, equal that of M. in manufs. and general industry, the presence alone at hand of an industrial market in the M. dist. and M. city influencing the intensive growth of such industrial crops as beet, hemp, potatoes,

and sunflower. Industry in the M. dist. also owes some of its development to the brown coal in the M. basin. White limestone is quarried and much used for building in the cap.; yellow marble quarries occur on the banks of the Oka. Since the revolution there has been considerable development of electrical power. Peat is extensively used as fuel in the factories, and in some places, e.g. Shatnra, the electric plant (opened in 1924-26), works on peat power. The M. dist. alone possesses greater supplies of electrical energy than any other industrial region in Europe. Scrap-iron and imported ores from the

famous are the monastery of St. Sergius, founded by one of the first Muscovite princes, and known for its silver shrine, said to be the richest in the world; and the vil. of Borodino (*q.v.*). 2. (Russian Moskva.) The ant. and present cap. of Russia and formerly the residence of the tsars, is situated in a highly cultivated and fertile dist. on the Moskva, 400 m. S.E. of Leningrad, with which it is in direct communication by railway. Before much of it was destroyed by fire in 1812, M. was perhaps the most irregularly built city in Europe, and that distinction to a great extent it still retains, for, as the main



MOSCOW AND THE RIVER MOSKVA
In the distance, left, is the Kremlin Palace

Lubok Press

Ukraine are used for the production of high-grade steel in the M. dist., especially for the purpose of supplying the engineering industry. The textile industries of the dist. specialise in the manuf. of fabrics of good quality as well as in special fabrics used in machine-building and in the chemical industries. Recently a number of modern motor roads, radiating from M. to Kiev, Minsk, and other large tns., have been constructed. The M. Region as a whole is better served by railways and modern roads than is any other part of the Soviet Union; it is excellently served by transport routes along which coal, iron, oil, grain, timber, sugar, cotton, and silk are carried to the large urb. and industrial centres. The value of the Volga to the M. dist. has been greatly increased by the construction of the M.-Volga canal (80 m.), which has been in operation since 1937, and big riv. steamers can now sail right into M. Among the places historically

object in 1813 was to build speedily, the streets rose again on the old model, undulating and crooked, and consisting of houses exhibiting the greatest variety in character and pretensions. Its hundreds of churches and convents, surmounted by gilt or variously coloured domes, its gardens and boulevards, and, above all, the high walls and crowded yet stately towers of the Kremlin or citadel, produce a most striking effect. The Kremlin, situated on the N. bank of the riv., forms the centre of the tn., and around it, with a radius of about 1 m., is a line of boulevards, extending, however, only on the N. side of the riv. Outside of this line, and concentric with it, is another line of boulevards, with a radius of $1\frac{1}{2}$ m., while beyond all, and forming the girdle of the city, is the outer rampart, with a circumference of 26 m. The Kremlin comprises the prin. buildings, as the cathedral of the Assumption of the Virgin, founded in 1326, a small but gorgeously decorated edifice; the cathedral

of the Archangel Michael, containing the tombs of all the tsars down to the time of Peter the Great, who changed the royal burial-place to St. Petersburg (now Leningrad); the church of the Annunciation, the floor of which is paved with jaspers, agates, and carnelians of various shapes; the tower of Ivan Veliky, 200 ft. in height and surmounted by a magnificent gilded dome, from which, as from all the domes of M., rises the 'honourable cross'; the Tsar Kolokol (king of bells), the greatest bell in the world; seq. palaces, and collections of antq. arms and other antiquities. The walls of the Kremlin are surrounded by eighteen towers, and pierced with five gates. The Kremlin is now occupied only by important gov. officials and the Kremlin command (see also KREMLIN). The number of Orthodox churches has, however, declined from over 100 before the revolution to a score. Those closed included the seat of the acting patriarch and the last of the Lutheran churches. There are two univs., one founded in 1755 is the oldest in Russia, and both existed prior to the revolution of 1917, and are now administered by the People's Commissariat for Education.

M. is the seat of an extensive manufacturing and commercial industry; it imports largely and carries on a considerable export trade, especially with Asia. M. continued to develop even after Peter the Great moved his cap. to St. Petersburg. In the eighteenth century, when textile factories for producing woollen and linen fabrics for the army were set up, M. became an industrial as well as commercial centre. Later, with the construction of railways, M. became the hub of the entire Russian railway system, and this further influenced industrial expansion, notably in the development of more textile factories and metallurgical industries. Yet even up to the revolution of 1917 M. retained the appearance of a great Asiatic prov. tn.; most of its buildings were of wood, roads were in a primitive condition, sanitation and lighting were almost unknown. In 1917 the city became the focal point for the long-term industrial and economic planning of great parts of Soviet Russia; and as the agric. and secondary industries of the country expanded, so also did the industries of M. develop. Not only were new factories built but also large office and administrative blocks, with housing estates for the workers, who came to the city in great numbers. The pop., which was only 1,618,000 in 1917, was 2,000,000 in 1926, 3,500,000 in 1933, 4,000,000 in 1939, and to-day is 4,500,000. There are large chemical works and in pre-1917 Russia some 16 per cent of the output of that industry came from M., though the city is far away from the main sources of raw materials. M. is also an important centre of the manuf. of electrical machinery, precision lathes, watches, etc., requiring skill but relatively not much metal. The textile industry of R. is still largely concentrated in the older centres of production, of which M. is one. Silk manuf. was once concentrated entirely in M. but is now carried on also in many

other cities and tns. The finest thread is produced in M. A new glass machinery industry has developed. The majority of engineering works, mainly engaged in the production of machine tools, motor vehicles, and printing, textile, agric., electrical, etc., machinery, are located either in M. or in the neighbouring tns. The manuf. of machine tools and a great part of the motor vehicle industry is concentrated in M. itself. In (and around) M. are also manufactured woollen, silk, linen, and a variety of knitted goods. A variety of rubber goods, made from synthetic rubber of Yaroslav and other centres, is produced in M. M. has nine railway stations and an air port. The main European network of railways extends from Leningrad, through M., to Astrakhan and across the Urals. Under the Four Sea Ship Canal System, M. will be linked up with the Baltic, White, Black, and Caspian Seas; in 1937 the M.-Volga ship canal made M. accessible from the White and Baltic Seas. In 1925 an aviation company was formed for the purpose of extending the air routes from M. A regular air service was estab. between M. and Berlin before the Second World War. Modern M. is served by an excellent system of trains, buses, and trolley buses, and a new underground railway which technically and artistically has set an example to the caps. of the world. The industrial settlements are grouped in zones around the periphery of the city, separated from it and from each other by green belts. In 1923 the M. Municipal Bank was opened. It had a capital of 2,500,000 roubles, and its object was to supply credits for local trade industry, municipal activities, and housebuilding.

M. was settled by Great Russians in the twelfth century. In the fourteenth century, not only had it become the cap. of the Russian religious world, owing to the residence there of the metropolitan, but it had also become the actual cap. of Muscovy. In 1368, 1370, and 1372 it suffered from the inroads of the Lithuanians; in 1381 it was sacked by the Tatars. From 1415 to 1501 it was, on four separate occasions, partially destroyed by fires, and it was burned to the ground by Devlet-Girey, khan of the Crimean Tatars, in 1571. It was taken by the Poles in 1610, and remained in their possession till their expulsion by the Russians under Minin and Pozharsky in 1612. In 1682, 1689, and 1698 it was the theatre of the revolts of the 'strelitz.' In 1812 it was burnt by its own inhab. to prevent its falling into the hands of the Fr. After the revolution of 1917, the Soviet Gov. was estab. in M. in 1918. Near the Kremlin wall are the 'Graves of the Brothers,' 500 Bolshevik men and women who lost their lives during the revolution. The Lenin mausoleum is near. The Soviet State Planning Dept. in 1935 adopted a ten years' plan for the modernisation and enlargement of M. Under this plan the Kremlin and other national monuments were to be preserved, business and residential dists. regrouped, and provision made for blocks of lofty flats.

The scheme provided for an increase of the pop. to 5,000,000 and for the preservation of a 6-mile forest belt round the city, and large botanical gardens on the banks of the Moskva R. A series of spectacular trials of prominent Communists was held in M. in 1936-37. The trials were part of a general party purge, which resulted in the execution of many Communists who were hostile to Stalin (see under RUSSIA, History). In the Second World War there were Ger. air raids on M. on July 26, Aug. 2, 9, 16, and 23, 1941. The Ger. offensive against M. was begun in Oct. and the Soviet Gov. moved to Kuibishev. Stalin, however, remained in M. and a state of siege was proclaimed. There were further Ger. air raids on Nov. 1 and 8, 1941. The Ger. attack on the city was halted on the latter date, but a new Ger. offensive was begun about Nov. 22, which, however, was finally crushed on Dec. 13. See further under EASTERN FRONT or RUSSO-GERMAN CAMPAIGN IN SECOND WORLD WAR. See 'Wirt' Gerrare, *The Story of Moscow*, 1900; G. Duhamel, *Le Nouveau Moscow*, 1928; A. Wicksteed, *Ten Years in Soviet Moscow*, 1933; E. Lyons, *Modern Moscow*, 1935; E. Simon and W. Robson, *Moscow in the Making*, 1937; and P. Cochrane (trans.), *Moscow: Sketches in the Russian Capital*, 1947.

Moseilema, see MOSAYLIMA.

Moselekatsé, or **Moselikatse** (d. 1870), Zulu chieftain who fled from Zululand after his defeat by the Voortrekkers and set up a new kingdom N. of the Vaal R., where he estab. the Matabele kingdom. In 1827 he led the Amangwate Zulus against Moseshi, chief of the Basutos, and was defeated at the historic battle of Thaba Bosigo (see BUSTOLAND, History). Subsequently he gladly welcomed Robert Moffat as his missionary. See J. P. R. Wallis (editor), *Matabele Journals of Robert Moffat* (2 vols.), 1915.

Moseley, Henry Gwyn-Jeffreys (1887-1915). Eng. physicist. Killed at Gallipoli on Aug. 10, 1915. He carried out much work on the structure of the atom and showed that the atomic number of an element may be deduced from its X-ray spectrum.

Moselle, or **Mosel**, kind of light wine obtained from the valley of the M. It is mild and delicate in flavour, not too acid, and digestible. The vines most usually grown on the M. are the Riesling and the Kleinberger, and the best growths are those of Brauneberg, Bernkastel, Piesport, and Zeltingen.

Moselle. 1. Or **Mosel**. Trib. of the Rhine, rises in the S.E. of the dept. of the Vosges, France, in two head-streams uniting at St. Maurice, and flows N. through the dept. Meurthe-et-Moselle, and Alsace-Lorraine, and joins the Rhine at Koblenz. Its chief trib. are the Meurthe in France and the Saar in Germany. It is navigable from Frouard. Length, 320 m.; area of basin, 10,950 sq. m. See C. Tower, *The Moselle*, 1913. 2. Dept. of France, ceded to Ger. from 1871 to 1918, on the boundary with Ger. to the E. and Luxembourg to the N. and N.E.

It consists largely of a plateau drained by the R. M. Its vineyards produce M. wine (q.v.). Coal and iron mines are of great importance, and its manufs. include machinery, chemicals, and textiles. There are nine arrons., and the cap. is Metz. Area 2403 sq. m. Pop. 622,145.

Moser, George Michael (1704-83), Swiss chaser and enameller, b. at Schaffhausen, but spent most of his life in England, where his watches and bracelets were in great request. He was drawing-master to George III., and assisted in establishing the Royal Academy, of which he was elected the first keeper in 1767. His daughter, Mary M. (d. 1819), was a flower painter, a foundation member of the Royal Academy. She and Angelica Kauffmann were the only women R.A.s until Dame Laura Knight was elected.

Moser, Gustav von (1825-1903), Ger. writer of comedies and farces. His chief works were *Ultimo* (1874); *Der Bibliothekar* (1878); *Der Registratur* (1879), all in collaboration with Adolf L'Arronge (1838-1908), Ger. conductor and theatre manager. He also wrote *Krieg im Frieden* (1881), with Franz von Schönthan (1849-1913), Austrian dramatist, and chief director of the Vienna Municipal Theatre.

Moses (Heb. *Mōs̄heh*, Gk. *Mōs̄eys*), great Jewish lawgiver and judge. Son of Amram, of the tribe of Levi, and Jochebed, a woman of the same tribe, and brother of Aaron and Miriam. The records of his life and work found in the Pentateuch are very meagre, and if, as is now generally believed, the 'Books of M.' were not written until some 800 years later, are probably to a great extent legendary (see EXODUS; NUMBERS; DEUTERONOMY). He was said to have been born in Egypt and because at that time Pharaoh had decreed that every male child of the Hebs. should be destroyed, his mother Jochebed placed him in an ark upon the Nile, where he was found by Pharaoh's daughter, and adopted by her. Brought up as an Egyptian prince, his heart was yet with his own people, and, finding an Egyptian oppressing a Heb., he slew the Egyptian and then for safety fled into Midian, whence he received a divine call to return and lead the chosen people out of Egypt. (For the hist. of the plagues, the crossing of the Red Sea, and the fate of the Egyp. planks, see EXODUS.) For forty years he was military leader, social and religious organiser, and lawgiver to the turbulent tribes in the desert wanderings, finally dying on Pisgah, or Mt. Nebo, to the N.E. of the Dead Sea. For the details of his life recorded in the Pentateuch there may be insufficient historical foundation, but the deliverance from Egypt, his code of moral and social laws, his unwavering upholding of Jehovah as the one God, and his conquest of the land E. of Jordan must be accepted as facts. See W. Robertson Smith, *The Old Testament in the Jewish Church*, 1881 (2nd ed. 1902); G. Rawlinson, *Moses, his Life and Times*, 1887, in Men of the Bible Series; biographical studies by Oosterzee, 1875; H. L. Taylor, 1913; E. Fleig, 1928; E. L.

Watson, 1929; M. Buber, 1947; and S. Freud, *Moses and Monotheism*, 1939.

Moses Ben Maimon, see MAIMONIDES.

Moshesh (1785-1870), Basuto paramount chief and founder of the Basuto nation. He defeated the Zulu invaders from Matabeleland in 1827 and twice inflicted defeats on European commandos from the Orange Free State (1851, 1852), while in 1858 the Free State again felt the weight of M.'s hand, peace being eventually made through the mediation of Sir George Grey. In 1865 war again broke out between M. and the Free State, M., then eighty, being at length defeated, with the loss of the coveted land S. of the Caledon R. Equally able as a statesman and soldier, the stipulations which M. made in 1862 when first discussing terms under which Brit. protection might be extended to Basutoland contemplated only political control: 'The queen rules my people only through me. The man whom I ask from the queen to live with me will guide and direct me.' M. asked that no magistrates should be sent, and that native law should prevail, save with the consent of the Basuto. The proclamation of 1868 annexing Basutoland declared that the Basuto should be taken to be Brit. subjects; but at the outset relations were guided by the spirit of the discussions of 1862 rather than any assumption that the Brit. had acquired sovereign rights and indeed the spirit of these stipulations of M. is still the interpretation put by the Basuto on the terms of protection. See also BASUTOLAND History. See Sir A. Pum, *Report on Basutoland*, 1935, Cmd. 4907.

Mosler, Henry (1841-1920), Amer. artist; b. in New York. During the Civil war he acted as special artist in the W. for *Harper's Weekly*. Later he studied at Dusseldorf and Paris. Among his best-known pictures are 'The Lost Cause,' Civil war subject; and 'Le Retour,' (1879), the return of the prodigal son, bought by the Fr. Gov. for the Luxembourg.

Mosley, Sir Oswald Ernald, sixth Bart., b. 1896. He was educated at Winchester and R.M.C., Sandhurst. His first wife was Lady Cynthia Curzon, daughter of the Marquess Curzon of Kedleston, and after her death he married Mrs. Brian Guinness, a daughter of the second Baron Redesdale. He sat as Conservative M.P. for Harrow, 1918-22, as Independent 1922-24, and as Labour 1924-30. He was chancellor of the duchy of Lancaster in the Labour Gov. 1929-30. In Dec. 1930 he issued a manifesto, in which he warned the gov. of the need of developing a policy for dealing with the economic crisis, and in the early part of 1931 he and a band of followers seceded and formed a new party, which, however, failed to get a single seat at the election of 1931. His party was known as the Brit. Union of Fascists; their activities were the occasion of some violent mob riots in the years preceding the Second World War. At the end of May 1940 M. was arrested under the Defence Regulations, and a number of his adherents were also in-

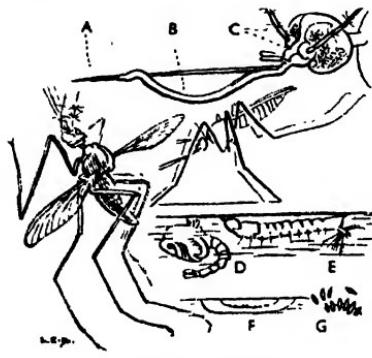
terred. After the war he founded M. Publications Ltd., and in 1948 a new Union movement.

Mosque (Arabic *masjid*). Muslim house of prayer. The form of the oldest Ms. (at Jerusalem and Cairo) is evidently derived from that of the Christian basilica. The original forms became, however, entirely obliterated in the progress of Mohammedan architecture, and the Ms., with their arched courts, gateways, domes, and minarets, became the most characteristic edifices of Saracenic art. While the main form of the M. is not a settled one, Ms. have three essential parts, the mihrab, or hall of prayer, which marks the direction of Mecca and which must consequently have had a different position in different countries; a place for ablutions, which precede prayer; and a large space for the entry and departure of the faithful, for the reading of the Koran and prayers. In this space are the makhra, or seat of the caliph, when one was required; and a place for the preservation of the Koran; and finally in the S.E. the mimbar, or kind of pulpit. A further requirement is the minaret (*q.v.*). Wherever the Mohammedan faith prevailed, from Spain to India, beautiful examples of these buildings exist. They vary considerably in style in different countries, the Saracens generally borrowing much from the architecture of the various nations who adopted their faith. In India, the Ms. have many features in common with the temples of the Jains, while in Turkey they resemble the Byzantine architecture of Constantinople. Everywhere the dome is one of the leading and most beautiful features of the Ms., which commonly consist of porticos surrounding an open square, in the centre of which is a tank or fountain for ablution. Arabesques and sentences of the Koran are inscribed upon the walls. The floor is covered with mats or carpets; there are no seats. In the direction in which Mecca lies there is a niche towards which the faithful are required to look when they pray. See also ARCHITECTURE; MOHAMMEDAN ARCHITECTURE; MOHAMMEDAN ART.

Mosquito Aircraft. In the Second World War the De Havilland Aircraft Company designed the D.H. 98, known as the M. Wood was used as the sole material for the basic structure to permit rapid production. The M. passed through various forms; beginning as a high-speed unarmed light bomber, it was afterwards used as night-fighter, fighter-bomber, and photographic reconnaissance machine. The Sea-M., for naval work, as well as a transport type, were modifications of the original M. Mark 34, the final version. It was powered by two 1625-h.p. Rolls-Royce Merlin engines, which gave it a range of 3500 m. and a maximum speed of 425 m.p.h.

Mosquitoes, or Gnats. These terms have no distinction, applying alike to those dipterous (two-winged) insects which form the family Culicidae, characterised by their long, slender, horny proboscis. The antennae are long and adorned with plumes or whorls of hairs, which in the males are

so dense as to be feather-like. The males feed on plant juices or may not feed at all. Only the females, which do not take part in the characteristic dances, suck blood, apparently an abnormal habit, which, according to some authorities, hastens their death. There are about twenty Brit. species, and the bite of some of them is as painful as of foreign species; but before the First World War, owing to the absence from Britain of ague and malaria, which are introduced by biting gnats (*Anopheles*), there was not the same danger. Owing to the return of men infected with malaria while on foreign service, there is still some danger of Brit. Anopholes carrying the disease. Sir Ronald Ross (q.v.) in 1897-98 discovered



MOSQUITO — FEMALE
A, legs; B, sheaths; C, eyes; D, pupa;
E, larva; F, egg raft; G, eggs.

the life hist. of malaria parasites in the *Anopheles* M. (see MALARIA; EPIDEMIOLOGY).

The number of Ms. can be substantially reduced by draining stagnant waters in the neighbourhood, or by encouraging the presence of sticklebacks and other small fish (in the W. Indies the tiny "millions" fishes, *Girardinus cyclopoideus*, are a natural enemy of M. larvae, on which they feed voraciously), or by depositing a thin film of paraffin on the surface of the water and so effectually preventing the larva from inhaling air, and causing their suffocation. The eggs of most species are laid on the surface of the water or on water plants. The common gnat *Culex* fastens its eggs to form a 'raft,' and the eggs of *Anopheles* are made buoyant by air cavities. The minute larva emerges and suspends itself beneath the surface of the water. The habit of the larva varies according to the species of M., but nearly all have to rise to the surface to breathe. Some suspend themselves horizontally beneath the surface and breathe through an air-tube projected just above the water. Others spend considerable time on the bed of the riv. or pond, and wriggle to the surface to breathe. One Brit. and a few foreign species obtain air from roots of aquatic plants. Growth

is rapid under favourable conditions, and the duration of the larval period varies considerably. Food consists of minute organisms waved into the mouth by constantly moving brush-like appendages. After the fourth moult, the larva pupates just beneath the surface of the water. The anterior end of the pupa is extremely large in proportion to the narrow posterior end, and from it breathing tubes rise just above the water. At the posterior end are flat appendages, 'paddles,' which may propel the pupa, or act as gills. The pupa does not feed, and after a few days its skin splits, and the M. liberates itself. Ms. certainly transmit malaria, yellow and dengue fevers, and elephantiasis, and possibly some other diseases (see ENTOMOLOGY; INSECT BITES AND STINGS; MALARIA; PARASITIC DISEASES; PARASITOLOGY).

Mosquitos, natives of the Mosquito coast, i.e. the E. or Atlantic seaboard of Nicaragua, and the S.E. portion of Honduras. They are of very mixed blood, the original natives of the dist. having intermarried with W. Indian Caribs and shipwrecked Negro slaves, while there is also a strain of white blood, dating from buccaneering days. There are sev. tribes, differing in physical and intellectual qualities. The best type are short, dark, and very intelligent. Many are nominally Christians and most of them speak Eng. A Brit. protectorate was claimed over the M. during 1655-1850, and friction with the U.S.A. on that account led to the Clayton-Bulwer Treaty. They are now under Nicaraguan rule. The Mosquito Coast embraces the E. corner of Honduras and the E. coast of Nicaragua, but the term is commonly restricted to that part of the seaboard of Nicaragua between the Wawa and Ipana Rrs.

Moss, maritime tn. in Akershus co., S. Norway, on Oslo Fjord (E.), 12 m. from Tousberg. Timber is exported, and there are iron mines near. There is a good harbour. The convention between Norway and Sweden signed here (1814), uniting the two states under one king, was annulled 1905. Pop. 17,000.

Mossamedes, seaport of Angola, Portuguese W. Africa, on Little Fish Bay, an excellent harbour. The dist. produces cotton, sugar, and fruit, and there are fishing and oil-refining industries. Pop. 4900.

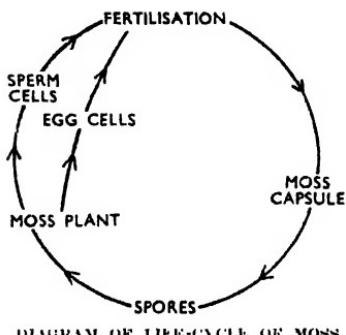
Mossbunker, see MENHADEN.

Mossel Bay (formerly Aliwal South), port of entry for the Union of S. Africa, and a municipality of the Cape Prov., 31° 11' S. lat., 22° 9' E. long. M. B. is mainly known to S. Africans on account of its natural bathing place called the Poort, the finest of its type in the Union. Out in the bay lies Seal Is., about 1 ac. in extent and inhabited by thousands of seals. M. B. is famous throughout the Union for its oysters and soles. M. B. is the terminus of a railway from Cape Town through Caledon and Swellendam. Frequent small steamer services from Table Bay to Natal call at M. B. It was one of the first bays known in S. Africa to the old Portuguese navigators, and in about

1500 Pedro d'Ataide found refuge in what is to-day known as Munro's Bay from the storm which wrecked most of his fleet. A year later João da Nova settled there and built a hermitage, which is claimed to have been the first Christian place of worship in S. Africa. Pop. 3000 (European); all races 6000.

Mossend, tn. of N.E. Lanark, Scotland, 3 m. N.E. of Hamilton, with extensive iron and steel works. Pop. 4000.

Mosses (*Musci*), group of plants which with the liverworts (Hepaticae) and the hornworts (Anthocerotae) form the second great sub-division, the Bryophyta, of the vegetable kingdom. They are arranged in three sub-groups, Sphagnales, Andreaeales, and Bryales, and, while the last named comprises a great number of genera and species, the others are represented each only by a single genus. The



numerous species of the genus *Sphagnum* occur in temperate and arctic climates and at high levels in the tropics. They are all bog or moorland plants, and their growth has contributed greatly to the formation of peat. They are usually seen as pale green or reddish patches, and in the deeper pools often attain a length of several feet. The leaves are extremely absorbent, so that these 'bog M.' are frequently used for packing round the roots of plants, and even as surgical dressings. About a dozen species occur in Britain. Of the genus *Andreaea* less than half a dozen species have been found in Britain, and they are limited to alpine districts. They are small M. of dark colour, and grow on bare rocks in tufts. The sub-group Bryales comprises all the other M., which in Britain alone number some six hundred species and over a hundred genera. Their habitat varies from soil, trees, and other damp places, and even in one genus under water, to comparatively dry rocks. They exhibit many interesting adaptations to their environment, especially in their arrangements for conducting water in the plant. Among the genera of this group is *Buxbaumia*, which seems to represent a stage that other M. have passed, and is regarded as the simplest type. In most

M. the protonema, the first stage, arising from the spore, disappears after the young moss plants have developed from it, but in *Buxbaumia*, as well as some other simple types, it persists, and is capable of assimilation, and the small plants which bear the antheridia and archegonia (male and female organs) are dependent upon it for nourishment. From this primitive stage to that in which the plants are small, and with but little branches, and to that in which the plants branch freely and differentiate the shoots, there is a fairly steady gradation. The specialisation of structure is mainly directed towards collecting and retaining as much water as possible. The sexual organs usually occur at the top of the main shoot, or of branches. Vegetative reproduction is common, but always through the protonema stage, and the social growth of M. is due mainly to the formation of numerous plants on the original protonema; reproduction by *gemmae* also occurs. All the M. exhibit an alternation of gametophyte and sporophyte generations, as indicated in the accompanying diagram; the gametophyte is the ordinary moss plant, whilst the sporophyte is the stalked sporogonium or capsule borne on this plant. See H. N. Dixon and H. G. Jannusen, *The Student's Handbook of British Mosses* (3rd ed.), 1924.

Mossley, municipal bor. and markt, tn. of Lancashire, England, on the Tame, 3 m. from Oldham. There are woolen and cotton mills, and iron foundries. Fairs are held in June and Oct. Pop. 9600.

Most, tn. in Czechoslovakia, on the R. Bida, 83 m. N.W. of Prague, in the part of Sudetenland ceded to Germany in 1938 and recovered after the war. M. stands on the chief coalfield of the country; other manufs. include machinery, sugar, and distilling; the Seiditz mineral springs are near. Pop. 35,330.

Mostaganem, fortified seaport of Algeria, 45 m. N.E. of Oran. It has a pier available for small vessels, and trades in alfalfa, horses, cereals, flour, and carpets. Pop. 36,960.

Mostar ('cold bridge'), cap. of Herzegovina, Yugoslavia, on the Narenta, 50 m. S.W. of Sarajevo. It is the seat of a Gk. and of a Rom. Catholic bishop. It is noted for grapes and wines. Tobacco and weapons are manufactured here. Pop. 20,200.

Most Favoured Nation Clause, clause that is often inserted in commercial treaties, the effect of which is that the one contracting nation guarantees to extend to the other the benefits conceded to any third nation or nations. Generally speaking, a treaty concerns none but the contracting states, and neither rights nor parties arise for states which are not parties to it. But treaties necessarily affect third states when they touch the previous treaty rights of such third states, and the most obvious instance of such an effect is in the case of a commercial treaty between A and B relating to matters which are already the subject of previous treaties between A and C, or B and C,

containing the M. F. N. C. Brit. Imperial Preference is exempted from the M. F. N. C. See R. C. Snyder, *The Most Favoured-Nation Clause*, 1948.

Mosul, walled tn., and liwa of Mosul, Iraq, on R. Tigris, 220 m. N.W. of Bagdad. The streets are narrow and irregular, and the houses of stone or brick, with flat roofs. It formerly had large manufs. of cotton cloths, named muslins, from the name of the tn. There is still caravan traffic in gallnuts, cotton, wool, hides, wax, and gum. Here is one of the four courts of appeal of Iraq. M. is on the standard gauge railway line from Bagdad to the Syrian frontier (Tel Kotchek) and also on the main bitumen sealed road running from the railhead at Kirkuk to the Turkish frontier at Zakhro. Pop., mostly Arab in speech, and including Mohammedans, Christians, and Jews, 100,000. The liwa includes the divs. of M., Arbil, Kirkuk, and Sulaimaniye. It covers a large part of the ancient kingdom of Assyria, the ruins of Nineveh being visible on the banks of the Tigris opposite the tn. of M. In 1923, a dispute arose between Great Britain and Turkey over the sovereignty of the dist. of M., and the N. boundary of Iraq was settled in accordance with the opinion of the Permanent Court of International Justice. A concession for the exploitation of the oil in the liwa was granted to the Turkish Petroleum Company in 1925. Negotiations were completed in 1931 between Iraq, Great Britain, and France for the construction of the pipe line which, completed in 1934, runs from the oilfields to Haifa (Palestine) and Aleppo (Syria). Production was 4,300,000 tons in 1938. The oilfields now belong to the Iraq Petroleum Company, a concern jointly controlled by the (Brit.) Royal Dutch-Shell and (Amer.) Standard Oil groups, with some Fr. participation and a 5 per cent interest to the original Amer. owner. Pop. 533,488.

Moszkowski, Moritz (1854-1925), Polish composer, b. at Breslau (Wroclaw), Ger. Silesia. Taught pianoforte in Berlin and afterwards in Paris where he lived for thirty years. He had a great reputation as a solo pianist and also as a composer of pianoforte music. He also wrote overtures, concert suites, a piano concerto, a violin concerto, an opera, *Boabdil* (performed in Berlin in 1892); *Laurin*, a ballet (1896), and *Jeanne d'Arc*, a symphonic poem.

Motala, tn. of Östergotland co., Sweden, on Lake Wetter, 42 m. W.S.W. of Norrköping. There are important mechanical works, canon foundries, bridge and engine works, and machine shop near by. Pop. 5985.

Motanabbi, Abu'l-Tayyib Ahmed ibn-Hosain (915-65). Arabian poet. In 945 he set up claims to be a prophet, but was arrested and imprisoned, and spent the rest of his life as a kind of court poet to various princes in Arabia, Persia, and Egypt. His work is mainly panegyrical or satirical, and his collected poems were pub. with an introduction by J. von Hammer-Purgstall in 1824.

Motet, or Motett, polyphonic vocal form constructed chiefly with medieval church music. The theme on which a M. was constructed was generally taken from some popular song, the text consisting of a biblical paraphrase in Lat. It was used largely in the church music of Tallis, Palestrina, Byrd, and other composers. The music is contrapuntal in style with great delicacy of expression. Palestrina composed nearly 200 Ms. an alternative term for them at that time being 'cantiones sacrae.' The M. reached its maturity in the sixteenth century when it was the church counterpart of the Eng. madrigal. Bach wrote six splendid Ms. the *Singer dem Herrn* being one of them. The Rom. Catholic Church still uses the title for the varied setting of successive verses in a hymn or metrical psalm.

Moth Aircraft, the D.H. 60, designed by the De Havilland Aircraft Company in 1925, and widely used for private flying, being a light aircraft with an 80-h.p. Cirrus engine. The type was developed over the next twenty years; the Tiger Moth, D.H. 82, a twin-seat open cockpit biplane, was the R.A.F. standard primary trainer during the Second World War.

Mother, see FAMILY and MATRILINEAL.

Mother Carey's Chicken, see PETREL.

Mothercraft, see CHILD.

Mother of Pearl, see PEARL.

Mother-of-Pearl Clouds, see NOCTILUCENT CLOUDS.

Mother of Thousands, popular name applied to two different flowering herbs, the *Lunaria cymbalaria* and *Saxifraga sarmentosa*. The first-named is the European ivy-leaved toad-flax of the figwort order (see Toad Flax). The second, also called creeping sailor, strawberry geranium, and wandering Jew, is a native of China and Japan, with roundish lobed leaves.

Motherwell, William (1797-1835), Scottish poet, b. and educated in Glasgow. In 1819 he was appointed sheriff-clerk depute of Renfrewshire. He had antiquarian tastes, and a deep knowledge of the early hist. of Scottish ballad literature, which he turned to account in *Minstrelsy, Ancient and Modern* (1827), a collection of Scottish ballads with an historical introduction. In 1832 he collected and pub. his poems. He also joined Hogg in editing the works of Burns.

Motherwell, municipal and police burgh and tn. of N.E. Lanarkshire, Scotland, 1 m. from the r. b. of the Clyde, has coal mines and iron and steel works. It is named from an old well dedicated to the Virgin. Dalziel Jubilee Park was presented to commemorate Queen Victoria's Jubilee. M. was united with Wishaw (q.v.) in 1920. It returns one member to Parliament, the co. constituency including the burgh and the electoral div. of Dalziel-Overtown. Pop., 66,000.

Motherwort (*Leonurus cardiaca*), erect plant (Labiate family with deeply lobed radical leaves and dense axillary whorls of small pink flowers. The name is also given to mugwort (*Artemisia vulgaris*).

Moths (*Heaterocera*) are the second and larger section of Lepidoptera, and are

distinguished broadly from the other section, the butterflies (*Rhopalocera*), by some variable distinctions which suggest that the div. is somewhat artificial, for there is greater diversity of form and structure between some of the groups of M. than between them and butterflies. Contrasted with the knobbed or club-shaped antennae of butterflies, the antennae of Ms. are usually spindle-shaped, thread-like, or comb-like. The wings are generally held flat when at rest, not vertical. Ms. generally have a connecting hook for fastening the wings together; this is absent in butterflies. M. vary

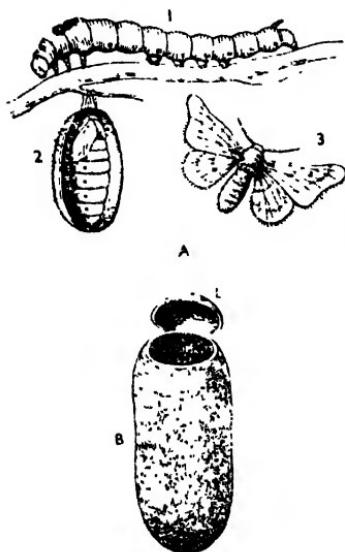
brilliant eye-spots, and when the moth is resting in a position to expose the spots they may be mistaken for the eyes of a snake; it has been suggested that in this way they help to scare away birds. The females of some species are wingless, as in the mottled umber, or are rudimentary, as in the winter moth, two common M. caught on the grease-bands on fruit trees. The china-mark M. (*Pyraustidiae*) are peculiar in the possession of aquatic larvae. The silkworm, the caterpillar of *Bombyx mori*, is the only member of the section of economic value, but on the other hand, great numbers are serious pests of cultivated crops, the damage in all cases being done in the larval stage. Among the most harmful of them are the goat, vapourer, lackey, cabbage, winter, and codlin M., and every one is familiar with the mischievous work of the larvae of the clothes moth. Hawk M. are important as pollinating agents. See R. A. Ferehault de Réaumur, *Mémoires pour servir à l'histoire des insectes*, 1731-42; W. Buckler, *Larvae of British Butterflies and Moths*, 1885-95; R. Meyrick, *Revised Handbook of British Lepidoptera*, 1938; R. South, *Moths of the British Isles*, 1939; W. J. Stokoe and G. H. T. Stovin (editors), *The Caterpillars of British Moths*, 1949.

Moti, Motzu, or Meh-tzu, Chinese philosopher; fl. fifth and fourth centuries B.C., teaching in the period of Mencius and Confucius. He was in effect the precursor of two schools which were destined to prevail for some centuries and then disappear. According to his system, Molism, Heaven (*T'ien*) loved man, and universal love was the foundation of society. Hence, he taught pacifism coupled with utilitarianism, and believed that all institutions should stand or fall by their ability to further human welfare. His doctrine of universal love or the brotherhood of man as the basis of ethics was strongly controverted by Mencius's dialectic, and his doctrines, which never had a wide vogue among the Chinese, have long been forgotten. See trans. of his works by A. Forke, 1922, and Y. P. Mei, 1929; study by Y. P. Mei, 1934; also A. David, *Socialisme chinois*, 1907.

Motif, see LEIT-MOTIF; WAGNER.

Motihari, tu. of Bihar, India, 75 m. N.N.W. of Patna. Pop. 13,000 (Hindus and Moslems).

Motion. Laws of, are three laws on which the whole system of dynamics is based. They were formulated by Newton in his *Principia*. These laws cannot be formally proved by experiment, or in any other way. They are justified, for example, by the fact that the theory of astronomy, which is based on dynamics, gives results and predictions which agree with the facts which are experimentally observed. The first law states that 'every body will maintain its state of rest, or of uniform motion in a straight line, unless compelled by some external force to change that state.' The second Law states that the 'rate of change of momentum is directly proportional to the force and takes place in the direction of



LIFE HISTORY OF A MOTH

A. 1, Caterpillar, $\times \frac{1}{2}$; 2, Cocoon cut open to show pupa lying within, $\times \frac{1}{4}$; 3, Imago, $\times \frac{1}{2}$; B. Cocoon of silk moth. 1, hd

greatly in size from a wing expanse of 7 to 8 in. to the almost invisible micro-lepidoptera. The large Nigerian moth measures about 8 in. from wing tip to wing tip when fully extended. It belongs to the family Saturnidae, and an Indian member of this family is probably the largest moth known. Though many exhibit no special beauty of colouring, others have a wealth of tint that is, perhaps, unique in nature, the colours occurring, as in all Lepidoptera, in the scales on the wings. The two uncoloured transparent spots, one on each of the upper wings, is a characteristic feature of the Saturnidae; they are due to the absence of scales at these places. On the lower wings of the Nigerian moth noticed above are two

the force.' The third law states that 'to every action there is an equal and opposite reaction,' or to put it more simply, if a body A exerts a force on a body B then simultaneously the body B exerts exactly equal and exactly opposite force on A. Einstein's theory necessitated slight modifications in Newton's views. See also DYNAMICS.

Motion Pictures, see CINEMATOGRAPH; and under PHOTOMICROGRAPHY.

Motive, desire which precedes and determines a voluntary act. This involves the anticipation of the final realisation, and the consummation is said to be the object or the *end* of the action, and the action itself is the means of gaining or realising the object of desire. It is easy to show that while the action is the cause of the (actual) pleasure, yet the *anticipation* of the pleasure is the cause of the action. So M. and end are often used as synonymous terms. See WILL.

Motley, John Lothrop (1814-77), Amer. historian, b. at Dorchester, a suburb of Boston, Massachusetts. He was educated at Harvard, where O. W. Holmes (q.v.), afterwards his biographer, was a fellow student. After graduating he went to Europe, studied at Göttingen and Berlin, and visited Italy. On his return he studied law, and was admitted to the Bar in 1837. He did not, however, practise, and was in 1840 sent to St. Petersburg as secretary of legation, but returned in 1842. Meanwhile, having pub. two novels, *Morton's Hope, or the Memoirs of a Provincial* (1839), and *Merry Mount: a Romance of the Massachusetts Colony* (1849), which had little success, he turned to hist., and attracted attention by some essays in various reviews. Having decided to write an historical work on Holland, he proceeded in 1851 to Europe to collect materials, and in 1856 pub. *The Rise of the Dutch Republic*. It was received with the highest approval by such critics as Fronde and Prescott, and at once took its place as a standard work; it has been trans. into Dutch and Fr. It was followed in 1860 by the first two vols. (concluding vols., 1867) of *The United Netherlands, from the Death of William the Silent to the Synod of Dort*. On the outbreak of the Amer. Civil war, M. pub. (with his initials) in *The Times* papers on the hist. of the relations between N. and S.; these were reprinted in pamphlet form in 1861 with the title *Causes of the Civil War in America*. The same year M. was appointed U.S. minister at Vienna, and in 1869 at London. His latest work was *The Life and Death of John of Barneveld, with a View of the Causes of the Thirty Years War* (1874). M. holds a high place among historical writers, on account of his research and accuracy and his vivid and dramatic style, which shows the influence of Carlyle. An ed. of his works was pub. in 9 vols., 1904. See his correspondence, ed. by G. W. Curtis, 1889; and life by S. St. J. Mildmay, 1910.

Motmot, or Houtou (*Momotus*), genus of birds which inhabit dense forests in tropical America. The plumage is brilliant, green and blue predominating; the tail is

long. No nest is made, the eggs being laid in holes in the trees. The food is mainly insects and fruit.

Motor Aphasia, see APHESIA.

Motor Boats. Smaller craft powered by internal-combustion engines, which are used in riv., lake, or coastal traffic, or for fishing. Larger ocean-going vessels are called motor ships (q.v.). Open launches are usually 15-35 ft. in overall length, with a motor of from 5 to 30 h.p., doing up to 30 or in some cases up to 35 knots; cabin cruisers, of 20-30 ft. overall length, usually have a 10-20 h.p. motor, doing about 8-10 knots. Speed-boats are built on the hydroplane principle: at high speed the bow rises up over the water and the boat skims along the surface, thereby reducing resistance. This is achieved by a deeply submerged propeller on a slanting shaft, and by making the stern of shallow, almost rectangular cross-section cutting out all superfluous wood. One of the earliest hydroplanes was in fact completely box-shaped. It was found, however, that this shape was liable to excessive vibrations at speed, and greater stability was obtained by confining the shallow box shape to one-third to a half of the hull length at the stern, and then dropping the bottom through a step of a few inches, as shown in the sketch. Sometimes more steps are provided. The *Miss England III.*, which gained the world record (119.81 m.p.h.) in 1932 had a single step in the hull-bottom and two deeply submerged propellers, which gave increased directional stability. The record was beaten later in the year by *Miss America X.* (124.91 m.p.h.). The record stood until 1939 when Sir Malcolm Campbell (q.v.) attained a speed of 141.74 m.p.h. in his *Bluebird* on Coniston Water.

M. B. are usually built of wood, either mahogany, oak, teak, pitch-pine, larch, or Brazilian cedar. Different kinds of wood are often used for the different parts of hull and superstructure. The hull may be clench-built, each plank overlapping the edge of the one below it, or carvel-built, the planed edges of the planks butting together to form a smooth surface. The latter method gives a better appearance and less resistance. Where a very light hull is required, two or more skins of thin wood are nailed, screwed, or sewn together with a layer of oiled calico, silk, or canvas between. Recently aluminium alloy, laminated plywood, or plastics have been used and developments in this direction may be expected.

Engines.-- The petrol engines used in M. B. are generally of the same design as those used in motor cars (q.v.), incorporating change-speed and reversing gear. The latter is sometimes dispensed with, and a mechanism for reversing the pitch of the propeller blades is introduced. As the most efficient propeller speed is about 1000 r.p.m. the marine engine is usually slower than the car engine, and therefore heavier per h.p. developed. This is generally of no great importance, but in cases where weight must be reduced, propeller efficiency is sacrificed. Recently the compression-ignition engine

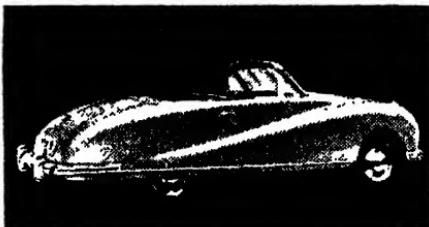
has been steadily gaining in favour, partly because of its higher thermal efficiency and cheaper fuel, partly because of the lesser fire risk. Petrol is highly volatile, and in time a layer of highly inflammable petrol-air mixture forms near the bottom of the boat; and fire at sea is a much more dangerous affair than on land. Further advantages of the compression-ignition engine are its reliability during manœuvring, since there is no tendency to stalling, and the absence of the magneto, which is liable to damage from dampness and water.

Motor Cars.—*Historical.* Just as it has always been the aim of man to fly, so he has endeavoured to produce a horseless vehicle. In the sixteenth century Johann Hautach produced a vehicle propelled by coiled springs; the Dutch attempted the use of sails, while even steam carriages are recorded. Ramsay and Wildgoose patented in England, in 1619, a horseless carriage. Cugnot, a Frenchman, is, however, entitled to the credit of constructing a vehicle in 1770 which contained the germs of the modern car. His steam carriage on three wheels carried two passengers at 2 m.p.h., a speed he afterwards increased to 4 m.p.h. Dallery in 1780 ran a steam car in Avranches. Murdock in 1784 and Symington at about the same time experimented in the same direction. In France, the revolution appears to have postponed further effort, but in England Richard Trevithick attained success in 1801. His steam motor in 1802 covered the distance of 90 m. from Camborne to Plymouth. In 1803 his carriage with wheels of 10 ft. diameter, and a horizontal instead of a vertical engine, ran at 10 m.p.h., but his further efforts were confined to locomotives for railroads. The curiously mistaken notions as to smooth wheels (one mathematician tried to prove that they would merely revolve on the spot under weight), which led to Stevenson's ratchet-rails, led also to curious attempts on the part of Brunton (1813), Gordon, and Gurney to succeed with foot-and-leg propellers. Gurney, who spent large sums of money in experiment, built a coach in 1826 which ascended Highgate Hill. In 1828 he accomplished the journey from London to Bath, and in 1829 a trip through Reading, Devizes, and Melksham at such a pace that the horses of a mail cart were 'hard put to it' to keep up. Meanwhile James in 1823 had succeeded with the first tubular boiler, and in 1829 carried fifteen passengers at 12 m.p.h. In 1831 Dance ran Gurney's steam carriage regularly between Cheltenham and Gloucester at 12 m.p.h., his coke consumption being 4d. per hour. In four months it ran 3500 m. and carried 3000 passengers. Messrs. Ogle & Summers in 1830 built a car which underwent trials before a select commission of the House of Commons; it worked at 250 lb./sq. in. boiler pressure, attained a speed of 35 m.p.h., climbed a hill at 24½ m.p.h., and ran 800 m. without a breakdown. This last is a marvellous result considering the state of the roads, and the fact that the car was not hung on springs. The speed

exceeded that of Stephenson's 'Rocket' running on rails in 1829! This select commission reported in extremely favourable terms, and in particular recommended a lowering of tolls, which were then often twenty times those for horse vehicles. Largely as a consequence of this, many motor vehicles were introduced: Hancock's 'Infant' ran from London to Bristol twice; his 'Autopsy' in 1833 plied regularly between Finsbury Square and Pentonville. In this he adopted the direct drive by the crankshaft, but afterwards the chain drive, using common chains. Other services plied between Paddington and the Bank, London and Greenwich, London and Windsor, London and Stratford. More ambitious still was Dr. Church's service between London and Birmingham, 1833. All this remarkable success, so little known to the modern motorist, experienced much opposition. Gurney had been stoned by a crowd egged on by irate postillions; coach proprietors and landowners were hostile; and the growing interest of railway companies led to repressive legislation. In spite of this, we hear of Hill's steam coach in 1843 running regularly between Deptford and Hastings, negotiating hills 1 in 12 and 1 in 13, performing the return journey in one day. This coach is interesting as being fitted with a differential gear. In 1862 Patterson ran a steam coach, and Yarrow had one in the exhibition. In 1871 Thompson's road steamers adopted rubber tyres on the driving wheel for the first time; the 'Ravee' performed the record-length journey from Ipswich to Edinburgh and back, a set of three rubber tyres costing £241. The modern M. C. industry dates from the perfection of the internal-combustion engine (*q.v.*) by Otto, 1876, and the patenting in 1885 by Daimler of a single-cylinder high-speed engine. Messrs. Panhard and Levassor acquired the Fr. and Belgian rights to use the engine, and constructed a car in 1894. In the meanwhile Benz, in 1885, had produced a motor tricycle, also using a petrol engine. Daimler produced the first double-cylinder V-type engine in 1889, while in 1893-94 Serpollet succeeded with his steam carriage. Press enterprise on the part of Giffard, editor of the *Petit Journal*, was responsible for the Paris-Rouen race in 1894, won by the De Dion-Bouton steam tractor. The next year saw the Paris-Bordeaux race won by Levassor driving a Daimler motor 735 m. at 14·9 m.p.h. This led to the founding of the Automobile Club of France by the comte de Dion. Onward from this clubs were formed, races arranged, and the system of definite trials started. In 1899 the Automobile Club of Great Britain held its first trials, and included heavy vehicles. In the previous year trials had been held for electric vehicles in France, following on those for heavy vehicles in 1897. In the early days of Brit. motor Industry, from 1895 when the restrictions on road traffic were lifted, the only outstanding achievement was F. W. Lanchester's design of a car which was the first to embody all essential features of the modern car.

Otherwise the main occupation of the industry was the assembling of motors designed abroad while the U.S.A. and France made strides in development. Progress has been rapid, especially since 1918. In the first six months of 1948 Great Britain took the lead as an exporting country, with 115,980 cars. The total production capacity of the industry is now reckoned as 750,000 cars per annum, and the number of employees directly engaged is estimated at 186,000. But whereas the early years saw a large number of small producers (ninety-six in 1922) making a great variety of specialised cars, the market is at present supplied by only thirty-two manufacturers, and of these Austin, Nuffield, Standard, Rootes, Vauxhall, and Ford between them account for 90 per cent of the production. At the same time, the number of models has been greatly reduced. Apart from the possible development of the gas turbine and the compression-ignition engine, no drastic change in design of cars is anticipated in

eight-compressor unit developing 160 brake horse power at 35,000 r.p.m. are so far advanced that a jet car may be run in a not too distant future. The weight of the power unit is about 300 lb., compared with 1000 lb. for a spark-ignition and 2000 lb. for a compression-ignition engine of equal power. Of the reciprocating internal-combustion engines, the compression-ignition type (see OIL ENGINES) is mainly used in lorries and other heavy vehicles destined for long journeys without frequent stopping. The engine is heavier, more robust, and of greater initial cost than a petrol engine of equal power, but is considerably more economical in fuel, though more discriminating as regards quality. It is also more noisy when running light, and the problem of accurately measuring and timing fuel injection becomes very intricate for smaller sizes of engine. For private cars, the spark-ignition reciprocating engine using 'petrol' (light oil) as fuel and working on the four-stroke cycle



1949: AUSTIN A 90 ATLANTIC CONVERTIBLE, AND MORRIS MINOR SALOON

the near future, but improvements in transmission, including clutch and gearbox, in fuel injection, and in design of electrical equipment are to be expected.

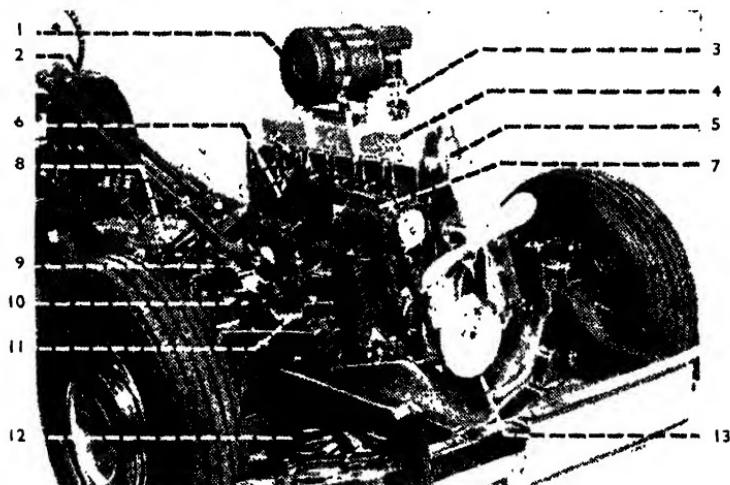
Modern Engines.—The steam engine suffers from the disadvantage that generation of steam in the boiler takes an appreciable time, and this weighs heavily against its excellent qualities of self-starting, smooth running, good acceleration, and flexibility of power output, and the manuf. of steam cars is now practically abandoned. The electric series motor is the most perfect traction motor known; self-starting, silent, flexible, simple to control. But as it needs a battery for the supply of current and present-day accumulators are very heavy in relation to their output, a car to cover considerable distances without recharging would be of quite impracticable weight. The use of the electric motor is therefore at present restricted to delivery vans in towns, with frequent stopping and starting, and for such purposes the electric vehicle has no superior. For ordinary road vehicles the internal-combustion engine is now the universally favoured power-unit. Of the various types of internal-combustion engine, the gas turbine for jet propulsion is still in the experimental stage, though at least one Brit. car-manufacturing firm claims that trials with a three-turbine,

(see INTERNAL-COMBUSTION ENGINES) is at present practically the only type used. The complete power unit of a car comprises the fuel tank with pump and filter, the carburettor, cylinders, ignition system, crankshaft, and transmission, and these are here dealt with in turn. Cooling and lubrication come next, and finally electrical equipment, steering, and suspension.

The fuel tank, usually made of sheet metal and with a capacity of from 6 to 20 gal. or more, is nowadays mounted at the back of the car, but in earlier models it is found at the front, behind the engine. In modern cars, fuel must therefore be conveyed to the engine by a pump. This is usually of the diaphragm type. Fuel passes through a one-way valve into a shallow chamber, the bottom of which is formed by the diaphragm, which is held in the 'compression' position by a spring underneath, and moved down to the 'suction' position by compression of the spring. When the spring is released, the fuel passes through another one-way valve to the carburettor. The compression and release of the spring may be operated by a lever-and-eccentric combination from the cam-shaft of the engine, or electrically. In the S.U. electric pump the diaphragm is vertical and is fitted with an iron disk (armature), which is attracted to or released from an electromagnet (in the form

of an iron pot with magnetising winding), according as the exciting current is switched on or off by a bronze rod mounted on the armature. Other pumps still in use are the S. U. Petrolift (electric) and the Autovac. The pump is fitted with a gauze oil-filter, and a float in the tank operates the petrol gauge fitted on the dashboard. This may be simply an ammeter indicating the current (supplied from the car battery) in a circuit containing a variable resistance controlled by a lever attached to the float. As the float moves up or down, the resistance, and therefore the current, is altered.

sists of two chambers—the float chamber, containing the supply of petrol from the main tank, so regulated as to stand at a fixed level by a float actuating a needle-valve; and a mixing chamber, into which a duct from the float chamber leads the fuel. This duct ends in a fine jet, whose orifice is carefully calibrated and so arranged that the level of the liquid is always slightly below the level of the orifice. This prevents waste due to petrol overflowing from the jet if the carburettor is left standing out of the horizontal position. The jet is placed in the centre of the air passage at a point where it has



1, Air-cleaner; 2, steering-column gear-change; 3, Stromberg carburettor; 4, six-cylinder overhead valve engine; 5, thermostat; 6, distributor with automatic and vacuum advance; 7, dynamo; 8, four-speed synchromesh gear-box; 9, camcar steering; 10, power-operated hydraulic jack; 11, hydraulic shock-absorber; 12, independent front-extension; 13, crankshaft torsional vibration damper and fan pulley.

The carburettor has to break up the liquid fuel into a mist of fine droplets and mix it with the correct proportion of air for efficient combustion, according to the needs of the engine. The theoretically correct weight ratio of air to petrol for complete combustion is 14.5:1; benzol requires 13.2:1. A slightly lean mixture (16 or 17:1) gives a higher thermal efficiency, but if the mixture is too weak the power falls away rapidly; a somewhat richer mixture is needed for maximum power development, although the efficiency is lowered. On slow running, on starting and on accelerating, a richer mixture is likewise needed. The mixture is carried from the carburettor through a pipe or passage having a connection to each cylinder, and referred to as the induction manifold. The modern carburettor con-

been reduced in diameter, called the choke-tube. One of the wide ends of the choke-tube communicates with the atmosphere, and the other, past the throttle valve, with the cylinder, via the induction manifold. The suction produced in the cylinder of the engine during the induction stroke causes air to rush through the choke-tube; this produces a drop in pressure at the throat in the vicinity of the jet, with the result that fuel issues from the jet and, meeting the high-velocity air stream, is broken up into minute particles, which are intimately mixed with the air. Heat is sometimes supplied by heating a portion of the mixing chamber or induction manifold by jacketing them with hot water or exhaust gases. Special carburettors are necessary for paraffin and alcohol, owing to these

fuels being less volatile than petrol, but not for benzol, although in this case the float should be slightly weighted if the level of the fuel in the float chamber is to be maintained, because of the greater density of benzol. There are various designs of carburetors (*g.v.*) in use in modern cars, mostly employing the vertical down-draught tube. The Zenith V-type has two jets, one of which is a gravity jet, the other actuated by pressure variations and functioning as a compensator, in addition to a pilot jet for slow running. The Solex contains a main jet feeding a complete controllable 'spray assembly.' The S.U. uses a variable jet, controlled by a tapered needle, and a variable air passage. The Stromberg is an intricate combination of jets and chokes ensuring adjustments of mixture strength for varying air-speed.

The cylinders may be two, three, four, six, eight, or twelve in number, arranged in different ways. By increasing the number of cylinders and arranging the firing strokes at suitable intervals, the unevenness of the action, due to the fact that only one stroke in four in each cylinder is a working stroke, can be largely eliminated and a more uniform torque applied to the crankshaft. Two cylinders were previously placed in V-form, but the modern arrangement is horizontal opposed-motion, one cylinder on either side of the crankshaft. Three cylinders are now always placed radially. Four cylinders (usual in Brit. cars) are placed vertically in line, the two inner cylinders working in synchronism and in opposition to the two outer. Six cylinders are likewise placed vertically in line and the crankpins are spaced at 120° apart, the cylinders firing in the order 1, 5, 3, 6, 2, 4. Eight cylinders are either vertical in line, or in two banks of four, in V-form. Twelve cylinders are usually set in two banks in V-form. Other types of cylinder arrangement, such as five radial, three banks in W-form, or horizontal opposed-motion with four, six, or eight cylinders, have been used for special purposes like racing.

The valves in modern car engines are almost exclusively of the poppet or mushroom type, though rotary and sleeve valves have been tried with some success. The valves may be arranged at one side of the cylinder, the valve-head and seat being placed in a special pocket with the stem below the head, or overhead with the seat in the cylinder roof and the stem above, sometimes inclined at 40° , sometimes vertical. The valves are operated by lever and pushrod from the cam-shaft.

Ignition.—Just before the piston reaches the top of the stroke, the fuel mixture, which is then compressed, is ignited by a spark. To ensure this, a sparking plug is screwed into the combustion chamber, introducing two electrodes forming the spark gap (about 0.02 in. apart), one of which is earthed, i.e. connected to the metal body of the plug and thus to the frame of the engine, while the other is connected to a terminal at the top of the plug but otherwise carefully insulated

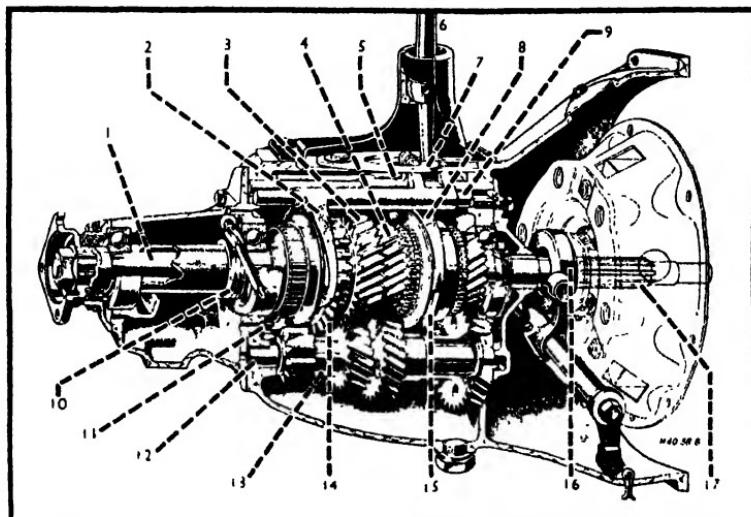
from all other metal parts, usually by ceramic material. When the insulated electrode is charged to a high potential through connecting the terminal to a high voltage generator, a spark bridges the gap between the electrodes. The high voltage may be generated by an induction coil or a magneto. The induction coil has a primary winding of copper wire which will carry 2-3 amperes when connected to the 6-V. or 12-V. car battery, and (usually inside the primary coil) a secondary winding of thousands of turns of very fine copper wire wound on a core of a bundle of soft-iron wires. A current in the primary generates a magnetic field mainly concentrated in the core. When the current is broken, the field vanishes and the variation induces an E.M.F. in the secondary proportional to the number of secondary turns and to the speed of breaking and depending also on the field strength. An E.M.F. is also induced in the primary, and to prevent consequent sparking at the contacts, a condenser is shunted across the gap, the result being that the primary induced E.M.F. surges between the coil and the condenser in a series of decaying oscillations. When the wave returns (with diminished amplitude) to the coil, the contacts should be so far apart that no spark occurs. One contact of the contact breaker is fixed, and insulated, the other (earthed) is moved by a lever-and-cam arrangement, driven by the engine, ensuring that a break occurs for each cylinder at the correct time. The secondary also has one terminal earthed, while the other is connected to a carbon 'brush' sliding on a rotating disk with a projecting arm, fixed on, but insulated from, the same shaft as the contact-breaker cam; as the disk rotates, the arm sweeps past but very close to metal knobs, one for each cylinder, connected to the corresponding sparking-plug terminals, thus transmitting the high potential to each plug in turn, through a very small spark bridging from the arm to the knob. The timing of the spark has to be adjusted to the engine speed and the throttle opening, and this is in modern cars done automatically. Apart from the automatic timing device, of which there are various designs, a manual adjustment is often available. Knocking may be remedied by retarding the spark. The magneto has a permanent magnet in the gap of which an H-shaped soft-iron armature is rotated, driven by the engine. The armature carries a primary winding, the current in which is interrupted, at certain points of the rotation, by a contact-breaker, inducing thereby a high E.M.F. in the secondary, which has a large number of turns of fine wire. An alternative design has a stationary armature while the magnet is rotated.

Transmission.—The power developed in the engine is transmitted to (usually) two of the road wheels, and at present the back wheels are used in most cars. This involves a propeller shaft from the engine to the rear of the car, and there are other considerations, connected with steering,

which favour front-wheel drive, and future developments may lead in this direction. The power is taken from the flywheel to one end of the crankshaft. This latter is enclosed in the crankcase under the cylinders and has a short parallel shaft length for each cylinder, some distance from the main shaft, and connected to it by short webs; the main shaft is interrupted between the webs. The pistons are connected to the short arms by connecting rods, so that when the crankshaft rotates the connecting rods move the pistons up and down. It is necessary to

surrounded by a cylindrical casting, the casing being filled with oil, which is set in motion by the impeller and drives a turbine fitted to the main propeller shaft.

The internal-combustion engine is most efficient at a speed considerably higher than that of the road wheels of a car, and on climbing a hill it is necessary to reduce the speed of the road wheels still further while keeping the engine running at full speed. It is also necessary to provide means of reversing the car, as the engine cannot reverse. These adjustments are made possible by a set of gears enclosed



FOUR-SPEED SYNCHROMESH GEAR-BOX (AUSTIN A 40)

- 1, Third motion shaft;
- 2, first and second speed selector fork;
- 3, second speed gear;
- 4, reverse speed selector fork;
- 5, third speed gear;
- 6, change speed lever;
- 7, change speed gate;
- 8, top and third speed selector fork;
- 9, selector rods;
- 10, speedometer pinion and wheel;
- 11, reverse gear;
- 12, layshaft;
- 13, layshaft cluster gears;
- 14, first speed gear and second speed coupling sleeve;
- 15, top and third speed coupling sleeve;
- 16, clutch release bearing;
- 17, first-motion shaft.

be able to disengage the engine from the road wheels, and to engage while the engine is running, without any jerk. This may be done by a clutch or by fluid-flywheel. The modern clutch is of the single-plate type. A disk fitted on the propeller shaft can be pressed against the flywheel face, usually by springs moving a so-called presser plate which is attached to the flywheel, but on the other side of the disk, so that the latter is gripped between flywheel and presser plate. The friction between the flywheel face and the disk carries the latter round with the flywheel, and the friction may be increased by cutting radial slits in the disk and turning the edges out of the plane of the disk. The earlier cone-type clutch is now rarely used. In the fluid-flywheel drive an impeller wheel is bolted to the flywheel and

in the gear-box. The clutch shaft carries a small gear-wheel, which engages permanently with a large gear-wheel on a parallel shaft (layshaft) below the clutch shaft (primary), the layshaft thus turning continuously at a slower rate. The layshaft carries a further three or four gear-wheels of different sizes, which can be brought to engage with corresponding gear-wheels on a third shaft in line with the primary by sliding and subsequent locking in position. In the modern synchromesh system the engaging of the different gears is operated by a clutch arrangement and the adjustment is carried out by movement of a selector fork. The epicyclic gear-box has a central gear (sun wheel) and a number of 'planetary' gears engaging with it and fixed on shafts carried by a circular frame. The planetary

gears also engage the inside gears on a ring. If the frame is locked, the planetary gears drive the ring, but if the ring is locked, the planetary gears travel round carrying the frame. A more recent form of speed adjustment makes use of hydraulic torque conversion, a development of the fluid-flywheel drive. In the case of rear-wheel drive which is usual at present, a propeller shaft conveys the power from the gear-box to the axle. It is provided with universal joints at both ends. The shaft drives the axle through bevel reduction gears. To allow for the fact that in driving the car on a curve the wheels follow different paths and must revolve at different speeds, a differential gear connects the two halves of the rear axle. Each half has a bevel gear at the end, the two facing each other at the middle, and the gap between them is bridged by a number of small bevel gears around the circumference, having their spindles mounted on a frame revolving around the shaft. When the road wheels, and thus the bevels on the half-shafts, revolve at the same speed, the bridging bevels do not move on their spindles but are simply carried round with the bigger bevels, but if the road wheels revolve at different speeds, the small bevels turn on their spindles and divide the load between the two half-axles.

Braking, usually acting on all four wheels, is effected in each case by two or four shoes mounted on a disk fixed to the axle, the shoes being moved outwards to rub against the inside of a drum on the hub of the wheel. The movement of the shoes may be operated mechanically or, as in the Lockheed system, by a hydraulic cylinder-and-piston arrangement. Other systems are the Girling mechanical, Hydromek and hydrostatic brakes, and the Clayton-Dewandre vacuum system. A hand brake is also usually employed.

Cooling.—Owing to the high temps. resulting from the combustion of the fuel in the cylinder, it is necessary to arrange some system of cooling the affected components. Failure to do this would lead to the breakdown of the lubrication between piston and cylinder walls, and this together with the greater rate of expansion of the former would cause seizure. The normal procedure in motor-car practice is to surround the cylinder and cylinder-head by a water-jacket. From the top of this jacket a pipe is taken to the radiator, which is a sheet-metal structure so designed as to expose a large surface area to the flow of air around it. The air-flow is assisted by a fan behind the radiator, driven by a belt from the engine. From the bottom of the radiator a pipe leads to the lower portion of the cylinder water-jacket. In some instances water circulation is maintained by means of convection (thermo-syphon system); in others, by means of a pump driven by the engine. The heat of combustion passes through the cylinder walls, etc., by conduction, and heats the water in the jacket, which then goes to the top of the radiator, where it is cooled by a stream of cool air, caused by the passage of the air through

the air. Sometimes the water flow is regulated by a thermostatically controlled valve. In the case of air-cooled engines, instead of a water-jacket a number of thin fins are cast concentric with the bore of the cylinder and across the top of the cylinder-head. These have the effect of increasing the area over which heat may be lost by radiation to the air. Air-cooled engines are chiefly used for motor cycles.

Lubrication.—The object of lubrication is to reduce friction, and consequently wear, between surfaces which are in rubbing contact with each other, e.g. piston and cylinder walls, main bearings, cans, etc. Lubricating oil is carried in the sump under the engine and oil is delivered under pressure, from a pump driven by the engine, via small pipes and ducts, to all parts of the mechanism requiring it. In some cases oil is pumped only to the main bearings and to open troughs. The connecting-rod big-ends splash into the troughs and in this way oil themselves, the cylinder walls, etc.

Electrical Equipment.—All modern M. C. use electric light for headlamps, etc., whilst engine-starter, wind-screen wiper, horn, radio, etc., also need electric power supply. As both lamps and starter-motor require power while the car is standing still, a power source independent of the engine is necessary, and all cars are therefore provided with a battery of accumulators (*g.r.*). The usual battery consists of three or six lead-acid or nine nickel-alkaline accumulators. The lead-acid accumulator when fully charged has an E.M.F. of about 2 V., but delivers current at 2 V. Three accumulators in series thus give a voltage of 6 V., six in series give a voltage of 12 V. The nickel-alkaline accumulator delivers current at about 1.4 V., and nine cells give about 12 V., but the voltage is less steady than that of lead-acid accumulators. In the lead-acid accumulator the electrodes consist of sets of lead grid plates, the grids of the positive plates being filled with lead peroxide, the grids of the negative plates with litharge. The plates are arranged alternately positive and negative, separated by insulating plates, and at the top all the positive plates are connected together, and likewise all the negative plates. The electrolyte is dilute sulphuric acid. When discharging the accumulator, both the filling layers are gradually converted into lead sulphate; when the conversion is complete, the current ceases and the accumulator must be charged afresh. Accumulators must not be left uncharged, nor should the discharge be carried so far that the voltage 'runs down.' The storage capacity is measured in ampere-hours (A.h.) at a certain rate, e.g. 50 A.h. at 10 hrs. This means that the battery can supply 5 A. continuously for 10 hrs., but if the current is increased, say, to 10 A., the battery runs down in less than 5 hrs. The current density, or current per cm.² of plate area, must not exceed a certain value either in discharging or in charging the battery. The charging of a car

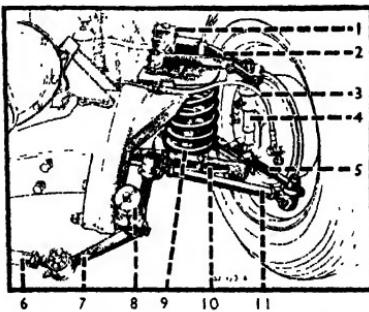
battery is done by a generator driven by the engine, generator and battery being so connected together that the voltage supplied by the combination is kept constant. In the modern compensated voltage control (C.V.C.) system, the generator voltage is kept constant by automatic field regulation and the battery automatically cut out of the generator circuit when fully charged, and also in all cases when the generator voltage falls below that of the battery, as when the engine is slowing down or stopping. Otherwise the battery would drive the generator as a motor. In earlier days a constant-current system was used, with a third-brush generator, but this scheme only works well at a definite speed, the battery acting as a buffer at other speeds, and the system is now obsolete. The windscreen wiper is nowadays usually worked by a small electric motor with a permanent-magnet field, and driven through gearing to reduce the speed. If two or more wiper blades are used they are still driven from a single motor and connected through rods or flexible cable. The electric horn consists essentially of a diaphragm acting as armature to an electromagnet. When the electromagnet is excited by pressing a push-button closing the circuit, the diaphragm is attracted to the pole of the electromagnet and in its motion breaks a contact interrupting the exciting current, in the same way as a 'buzzer.' The lighting installation comprises the head-lamps with arrangements for 'dipping' either by tilting the reflector or by providing two separate filaments in each lamp, rear lamps, sometimes small lamps diffusing light over the step when the door opens, and interior lamps for reading and for diffusing light on the dashboard.

Starting.—It is necessary to fill the cylinders with a charge and to compress it before ignition can take place. This is sometimes done by hand, using a starting-handle mounted in front of the engine, and which, by means of 'dogs,' engages with the engine shaft and gives it the necessary amount of rotation. When the engine starts, the dogs are thrown out of mesh and are held clear by means of a spring.

An electric starter is fitted to all modern cars. It consists of a small series-wound motor which operates a pinion which meshes with a toothed ring fixed round the flywheel. The electric current is supplied from the car batteries to the field magnets, and then through the armature coils, which has the effect of causing a repelling force between the armature coils and the field magnets, thus producing rotation of the armature. The small pinion is mounted on a sharp spiral on the motor shaft, and, when the latter rotates, the pinion, owing to its inertia, does not at first rotate with it. This causes the pinion to move along the shaft and to mesh with the teeth round the edge of the flywheel. When the engine starts, the pinion flies out of gear, owing to the fact that the flywheel drives it faster than the motor. Sometimes the dynamo is made to act as the starting motor. In

this case the dynamo-motor shaft is permanently geared to the engine shaft by a chain, so that when the engine has started it drives the motor, which then acts as a dynamo.

Steering and Suspension.—In steering a car the front wheels are turned, each wheel swivelling individually on a vertical axis. The design of the suspension varies in the different makes of car, but two important features are common. Firstly, with rear-wheel drive the front wheels are slightly 'toed in,' that is, the front edges are slightly closer together than the back edges, so that as the wheels are pushed along the slight play always present in bearings will allow the wheels to become parallel. The second point is



FRONT SUSPENSION (AUSTIN A 40)

1. Hydraulic shock absorber; 2, top wishbone arms; 3, hydraulic brake piping; 4, swivel pin; 5, steering arm; 6, steering cross tube; 7, steering double lever; 8, idler; 9, coil spring; 10, bottom wishbone arms; 11, steering side tube.

that when turning a corner all wheels describe concentric circles and the amount of swivelling must be so adjusted that no wheel skids. There are a number of different designs of springs (q.v.) in actual use, but the type at present favoured is the spiral-spring suspension, in combination with a torsion bar to prevent rolling, and usually with hydraulic shock-absorbers or suspension-dampers.

Horse-power.—Power is defined as the rate of doing work, and the unit used in connection with engines is 1 h.p., which is the equivalent of working at the rate of 33,000 foot-pounds per min. The b.h.p. is the h.p. which is available from an engine after deducting all mechanical losses in the engine itself, such as frictional and pumping losses, etc.; b.h.p. is measured by means of an apparatus called a dynamometer or brake. A common form of brake absorbs the power of the engine by friction, whilst another very important type, called the Froude hydraulic dynamometer, dissipates the energy by churning up water. The above types of brake enable the torque exerted by the engine shaft, T-lb.-ft., to be measured, and, by using the

equation. b.h.p. = $\frac{T2\pi N}{33,000}$, where N is the number of revs. per min. of the shaft, the b.h.p. may be calculated. The power required to drive a car at constant speed on a level depends partly on the weight of the car, partly on the air resistance, which is proportional to the square of the speed. As an example, to drive an ordinary saloon car at 50 m.p.h. requires roughly 20 h.p. In order to climb hills without undue decrease in speed, a certain amount of surplus power is needed. See also MOTOR TRANSPORT, COMMERCIAL; MOTOR TRANSPORT, MILITARY.

See M. Platt, *Automobile Brakes and Brake Testing*, 1939; H. K. Thomas, *Automobile Engineering*, 1939 (vols. 1-7); A. P. Young and L. Griffiths, *Automobile Electrical Equipment*, 1944; S. M. Hills, *Battery Electric Vehicles*, 1944; K. Newton and W. Steads, *The Motor Vehicle*, 1945; R. Dean-Averns, *Automobile Chassis Design*, 1948; E. P. Willoughby, *Motor Manual*, 1948; F. J. Camm, *Motor Car Principles and Practice*, 1948, and *Diesel Vehicles: Operation, Maintenance, and Repair* (5th ed.), 1949; *The Autocar Handbook* (20th ed.), 1949; and S. P. Smith, *The Electrical Equipment of Automobiles*, 1949; also the journals *Autocar* and *Motor* (weekly).

Motor Cycles. For touring and transport purposes the motor cycle has become a serious competitor to the light car owing to its lower first cost, lower taxation, and reduced fuel consumption, while its modest demands on garage accommodation and maintenance are at present weighty arguments in its favour. It is indispensable for the road patrols of the A.A. and R.A.C., and is extensively used by the police and the forces. As a vehicle of sport, for races, rough-track riding, and hill-climbing, the motorcycle makes a special appeal, and the simplicity and small size of the engine enables the owner to carry out repairs and to satisfy his interest in things mechanical by daily attention to the vehicle. The astounding performance of the dispatch riders at the Royal Tournament is an exhilarating exhibition of the possibilities of a motor cycle when perfectly mastered.

The term includes a variety of designs, from the three-wheel runabout car, the motor cycle and sidecar outfit, and the ordinary 'solo' machine to the scooter and the 'push-bike' with attached motor, though the latter is usually referred to as the autocycle. The h.p. varies from about 1 to 10 or 12, but the size of engine is usually indicated by the cylinder cubic centimetre (c.c.) capacity, i.e. the volume swept by the piston in one stroke, 100 c.c. corresponding roughly to 1 h.p. The light-weight 98-130 c.c. solo machine for light touring will do up to 120-140 m.p.g. and has a m.c. chain speed of 40-45 m.p.h. For carrying a pillion passenger the 250 c.c. is usual, and this has a maximum speed of 50-70 m.p.h. and at 25 m.p.h. the fuel consumption is at the rate of 110 m.p.g. The smallest size for a sidecar combination is the 350 c.c., doing

75-100 m.p.g., but the 500 c.c. is the more popular type. The larger sizes up to 1000 c.c. and more have more reserve power and are more flexible in working.

Engines are at present invariably of the light-oil (petrol) internal-combustion type, working on either the two-stroke or the four-stroke cycle (see INTERNAL-COMBUSTION ENGINES). The simplest of all is the one-cylinder, two-stroke engine, and owing to its smooth running (one power stroke in every two) and the absence of valves and tappets requiring attention it is still favoured on many cycles, especially for touring. The four-stroke engine is, however, slightly more efficient. In some four-stroke engines the valves are placed in a pocket at the side of the cylinder, which simplifies decarbonising and adjustment. In the more modern design the valves are placed in the roof of the cylinder (overhead, o.h.v.) and operated by levers and long pushrods from the camshaft, or by an overhead camshaft (o.h.c.) driven by bevel gear at the top of a long rod which carries another bevel gear at its lower end engaging with a gear on the main shaft. The one-cylinder engines are spoken of as 'singles,' as distinct from 'multi.' Both two- and four-stroke engines are used with two or four cylinders in various arrangements, such as the 'twin-flat' or horizontal opposed-motion, the twin-vertical, two or four cylinders in V-form, four vertical in line, or in square formation. The main consideration is that of fitting the cylinders into the frame and at the same time ensuring adequate access of cooling air. Most engines are air-cooled, and the cylinders are fitted with cooling ribs.

Carburettors (q.r.) are similar in principle to those used in motor cars and consist of a float-chamber, which may be top- or bottom-fed, and a mixing chamber which contains the jet or jets, air inlet, and the throttle adjusting the rate of delivery of the air-petrol mixture to the cylinder, and controlled from the handlebars. As the fuel tank is always uppermost on the frame, the carburettor is gravity-fed. The Amal carburettor has a main jet and a pilot jet which comes into action at small throttle openings. In the larger types the mixing chamber is vertical and the float-chamber is fitted with a small plunger ('teekler'), which is used for depressing the float and thus flooding the chamber when starting from cold. An air slide controls the amount of air admitted. The Bowden carburettor has two submerged jets and two above petrol level, and is completely automatic in action. The Villiers carburettor has the float-chamber fixed immediately below the mixing chamber and there is no pilot jet.

Ignition of the fuel is by an electric spark produced either by a high-tension magneto or by a coil. The latter is the cheaper arrangement, requires less attention, and gives easier starting (see under MOTOR CYCLES).

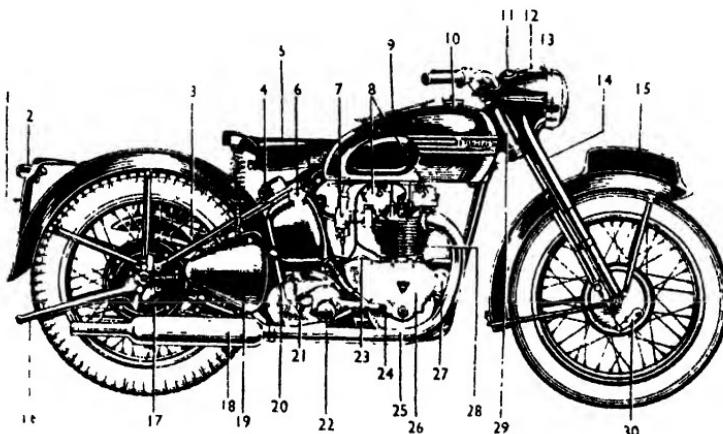
Transmission.—The internal-combustion engine used in M. C. develops maximum power at about 5000 r.p.m. and with the normal size of road wheels

this speed must be geared down in the ratio 5 : 1, this top gear corresponding to maximum speed on a level road. To enable the machine to travel at reduced speeds while still keeping the engine running at its optimum speed, the transmission ratio can be further reduced by a set of gears (two, three, or four) in the gear-box. The top-gear reduction is effected in most cycles by two chains, one (primary) connecting a small sprocket on the engine shaft with a large sprocket on the gear-box main shaft (gear ratio 2 : 1), the other (secondary) connecting a small sprocket on the gear-box main shaft with a large sprocket on the rear wheel shaft (ratio 2½ : 1). The chains are usually provided with a spring link and run in an

main shaft by dog clutches operated by the gear lever.

Electrical Equipment.—This consists of a generator with automatic voltage control, driven from the engine, connected through a battery-controlled charging circuit to a 6-V. accumulator battery, three lead-acid cells or five nickel-iron cells. A very simple system is the Villiers alternating-current generator and dry rectifier set with a dry battery for parking purposes.

Lubrication.—Castor oil is sometimes used as lubricant for racing purposes, but is unsuitable for ordinary use as it is likely to cause clogging and, like other vegetable oils, corrosion, unless the engine is frequently cleaned. Mineral oils are



TRIUMPH 650 C.C. THUNDERBIRD (1950)

1, Rear number plate; 2, rear light; 3, rear chain guard; 4, cut-out; 5, saddle; 6, oil tank; 7, carburettor; 8, valves; 9, luggage grid; 10, petrol tank; 11, instrument panel; 12, speedometer; 13, head lamp; 14, telescopic forks; 15, front number plate; 16, rear stand; 17, spring wheel hub; 18, silencer; 19, tool box; 20, kick-starter; 21, gear-box; 22, foot-rest; 23, magneto; 24, gear-change lever; 25, exhaust pipe; 26, timing case; 27, dynamo; 28, cylinder; 29, steering head; 30, front brake

oil bath. In some machines the primary chain is replaced by gear drive, and in some the secondary drive is by shaft and bevel gears. The engagement of the engine is effected by a friction clutch usually consisting of two plates, fixed on the gear-box shaft, one on either side of the large sprocket, the sprocket being surfaced with friction material, usually asbestos. When the plates are separated the sprocket revolves idly on ball bearings without transmitting any power to the shaft; when the plates are pressed against the sprocket, both plates and sprocket revolve together driving the shaft. The clutch is operated from the handlebar lever. Below the main shaft in the gear-box is the layshaft with its set of gears engaging with a corresponding set of wheels which can be clamped on the

now available which are fully as efficient and have none of the defects of vegetable and animal oils. The oil was formerly supplied to the crankcase by a hand-pump and there distributed to the engine by splashing. Hand-pumping is now largely superseded by automatic pumping, and the splash system is in four-stroke engines replaced by the dry-sump system in which oil is supplied by special feeds to the working parts of the engine. In two-stroke engines the 'petrol' system is sometimes used, the oil being added to the petrol, or the Villiers automatic drip feed, in which oil is forced by pressure to the engine.

Brakes are always of the expanding type, two brake shoes—usually of aluminium with woven asbestos lining—being pressed outwards to rub against the

inner surface of a drum attached to the wheel hub by the movement of a cam operated from the brake pedal.

Frames are usually made of pressed steel or built up of steel tubes joined by brazed steel lugs, and so shaped as to house the tank and engine and provide adequate lateral stiffness to keep the various parts, especially of the transmission, in true alignment. The rear wheel is usually spring-suspended and the front fork is always fitted with some spring device, either compression springs or rubber suspension. The modern telescopic front fork uses hydraulic or air-oil cushioning.

See Iliffe & Sons, Ltd., *Motor Cycles and how to manage them*; *The Motor Cyclist's Workshop*; and *Two-stroke Motor Cycles*. Temple Press Ltd., *Tuning for Speed* ('Slide Rule'), and *Modern Motor Cycle Maintenance* (B. Osborne). *Motor Cycling* and *The Motor Cycle* (weekly) contain valuable information on modern developments.

Motoring. The first exhibition of motor cars was held in England at Tunbridge Wells in 1895, being organised by Sir David Salomons. Since 1932 annual exhibitions have been held at Olympia, London, in Sept.-Oct. The Automobile Club de France, founded in 1896, with headquarters in Paris, was formerly the chief controlling force in international events and racing. To-day the controlling body is the International Association of Recognised Automobile Clubs, with its headquarters in Paris. This body consists of representatives of automobile clubs from the various countries, and not only governs all questions of motor sport, but all international touring affairs. In each country the recognised automobile club—for instance, in England, the Royal Automobile Club—is the governing body of sport so far as that country is concerned, subject to any international regulations made by the international body.

Brooklands, on which the accepted world's records were formerly made, has been out of use since 1939. It was constructed in 1906-7 at Weybridge, Surrey. The chief track in Great Britain is now the Silverstone circuit at Towcester, Northamptonshire. It consists roughly of two semi-rectangular portions at an angle of about 110° with one another. The full circuit is 3·8 m. but a cut reduces the length to 2·75 m.

The chief track in the U.S.A. is at Indianapolis, rectangular, curved ends, with two straights of 3301 ft. and two of 640 ft. Other tracks: France, Miramas (Provence), oval, 3½ m. to the lap, and Monthéry, S. of Paris, 1½ m. to the lap; Germany, Nurburg Ring, near Koblenz, constructed in 1927, in the mts., with two loops 13 m. and 11 m.; Italy, Monza, Milan, two rectangular tracks, curved ends, entire circuit, 6½ m.; Spain, Sitges, near Barcelona, 1½ m. to the lap; Argentina, San Martin, Buenos Aires, constructed in 1927, oval, 1½ m. to the lap. Beach tracks: Great Britain, Pendine Sands (Carmarthen Bay), Saltburn-by-the Sea, Skegness, Southport, and Wallasey;

U.S.A., Ormond-Daytona Beach, Florida, 20 m. long, with a 6-in. level stretch from 400 to 600 ft. wide at low water of smooth beach nearly as hard as asphalt.

The earliest competitive event for motor vehicles is commonly held to have been the Concours des Voitures sans Chevaux, organised by *Le Petit Journal* in France in 1891. The fastest time was that of Lemaître on a Peugeot averaging 11·5 m.p.h. Then came the race from Paris to Bordeaux and back, 1895, Levassor being the first winner (time, 2 days and 48 mins. at an average speed of 15 m.p.h.); from Paris to Marseilles and back, in 1896, organised by the Automobile Club de France, an average speed of 15½ m.p.h. being attained; many road-racing events, such as the 'tour de France,' over a distance of 1350 m. at an average speed of 35 m.p.h.; the Gordon-Bennett race, first held in 1899, over a course of 35½ m., and first won by Charron on a Panhard at 38·6 m.p.h. In 1898 came the first of a series of attempts to establish records over a flying kilometre. In the next few years manufacturers, generally, subordinated racing to the production of reliable cars for sale to the public, but several notable records were set up, including the now classic Indianapolis 500 m. record (since beaten) by Thomas on a Delage at 82·47 m.p.h.; the Tourist Trophy, 600 m. by K. Lee Guinness on a Sunbeam at 56·4 m.p.h. But after 1918 numerous important road races were held annually and many record-breaking races were accomplished over distances up to 1500 m., these being run to the earlier years over closed circuits, and later over newly constructed concrete racing tracks on the Continent. From 1924 came the series of flying-mile attempts at Pendine and Florida Beach, and in the same period board-track racing, a favourite form of the sport in America, the great event being the 500 m. race in Indianapolis. It was not until 1926, however, that American speed records were recognised by the International Association of Recognised Automobile Clubs, so that many speed performances before that date in Europe were held as official world's records, irrespective of higher speeds reached in America. The fastest speed ever attained by man on land is that of John R. Cobb, who was timed at 403·135 m.p.h. on one of the runs at Bonneville (Salt Beds), Utah, Sept. 16, 1947.

Opposite is (a) an abridged list of world's land speed records for the flying-kilometre or the flying-mile, giving an impressive picture of the development of racing cars in fifty years; since 1922 the figures are averages of two runs; and (b), pages 426 and 427, lists of world's records for varying distances. These, and other data, are courteously supplied by the Royal Automobile Club and the Contest Board of the Amer. Automobile Association.

The outstanding foreign events are the 500-m. race at Indianapolis, in May; the Fr. Grand Prix, Le Mans Grand Prix, and the Grand Prix de l'Endurance, in June; the Belgian Grand Prix, in July; and the It. Monza Grand Prix in Sept.

**(a) WORLD'S LAND SPEED RECORDS
FLYING-KILOMETRE OR FLYING-MILE**

Date	Driver	Car	Speed m.p.h.	Place	Distance
1898	Chasseloup-Laubat	Jeantaud (electric)	39.24	Achères	km.
1899	Jenatzy	Jenatzy (electric)	65.82	Achères	km.
1902	Serpotlet	Serpotlet (steam)	75.06	Nice	km.
1902	Augières	Mors (i.e.)	77.13	Dourdan	km.
1903	Ford	Ford (i.e.)	91.37	Lake St. Calix	mile
1904	Baras	Darracq (i.e.)	104.53	Ostend	km.
1905	Bowden	Mercedez (i.e.)	109.75	Daytona	mile
1906	Mariott	Stanley (steam)	127.65	Daytona	mile
1909	Henry	Benz (i.e.)	125.09	Brooklands	km.
1910	Oldfield	Benz (i.e.)	131.72	Daytona	mile
1911	Burman	Benz (i.e.)	111.73	Daytona	mile
1919	De Palma	Packard (i.e.)	149.87	Daytona	mile
1920	Milton	Duesenberg (i.e.)	156.01	Daytona	mile
1922	Guinness	Sunbeam (i.e.)	129.17	Brooklands	km.
1924	Campbell	Sunbeam (i.e.)	146.16	Pendine	km.
1925	Campbell	Sunbeam (i.e.)	150.86	Pendine	km.
1926	Segrave	Sunbeam (i.e.)	152.33	Southport	km.
1926	Thomas	Higham (i.e.)	171.09	Pendine	km.
1927	Campbell	Napier-Campbell (i.e.)	174.88	Pendine	km.
1927	Segrave	Sunbeam (i.e.)	203.79	Daytona	mile
1928	Keech	White Triplex (i.e.)	207.55	Daytona	mile
1929	Segrave	Irving Special (i.e.)	231.11	Daytona	km.
1931	Campbell	Napier-Campbell (i.e.)	246.09	Daytona	km.
1932	Campbell	Napier-Campbell (i.e.)	253.97	Daytona	mile
1933	Campbell	Rolls-Royce-Campbell (i.e.)	272.46	Daytona	km.
1935	Campbell	Rolls-Royce-Campbell (i.e.)	276.82	Daytona	mile
1935	Campbell	Campbell Special (i.e.)	301.13	Utah	mile
1937	Eyston	Thunderbolt No.1 (i.e.)	312.00	Utah	km.
1938	Cobb	Railton (i.e.)	250.20	Utah	mile
1938	Eyston	Thunderbolt No.1 (i.e.)	357.50	Utah	mile
1939	Cobb	Railton Special (i.e.)	369.70	Utah	km.
1947	Cobb	Railton Special (i.e.)	394.20	Utah	mile

Besides a large number of day and night trials, driving tests, endurance tests, hill-climbs, and other tests arranged by the various clubs, sometimes confined to cars of special type, the following events in Great Britain are noteworthy:

Date	Place	Promoting Club
April:	Cockshoot Trial (Lancashire) Land's End Trial (N. Devon) Highland Three Days (Scotland) Circuit of Ireland (Ireland)	M.G.C. Club (N.W. Centre) M.G.C. Scottish S.C.C. Ulster A.C.
May:	International Road Race (Jersey) British Grand Prix (Silverstone) British Empire Trophy (Isle of Man)	B.A.R.C. R.A.C. B.R.O.C.
August:	Tourist Trophy Race	R.A.C.
October:	Brit. Trials Championship	R.A.C.
November:	Veteran Car Run (London-Brighton)	R.A.C.

See Sir H. Segrave, *The Lure of Speed*, 1928; 'Owner-Driven' Motors and Motor-ing, 1930; J. W. Day, *Speed: the Authentic Life of Sir Malcolm Campbell*, 1931; Sir M. Campbell and J. W. Day, *The Life of the late Sir Henry Segrave*, 1931; Sir H. Birkin, *Full Throttle*, 1932; S. C. H. Davis, *Motor Racing*, 1932; M. Burns and A. P. Bradley, *Wheels Take Wings*, 1932; G. E. Eyston, *Flat Out*, 1933; B. R. Dierfield,

Motor Dictionary, 1939; R. F. Broad, *Motor Driving Made Easy*, 1940; P. Ladyman, *About a Motor Car*, 1946; R. W. Kidner, *Development of Road Motors*, 1947.

Motorists' Year Book: List of world's records, etc., is issued by the Royal Automobile Club, London; *Motorists' Diary* (ann.); *Motor Manual* (ann.).

See also tables on pages 426 and 427.

(b) WORLD'S LAND
FOR DISTANCES UP TO

<i>Distance or Time</i>	<i>Start</i>	<i>Make of Car</i>	<i>Driver</i>	<i>Cyls.</i>	<i>Bore</i>	<i>Stroke</i>	<i>c.c.</i>
1 km.	s.s.	Auto-Union	Rosemeyer	16	75	85	6,008
1 km.	f.s.	Railton Special	Cobb	24	140	130	48,029
1 m.	s.s.	Auto Union	Rosemeyer	16	75	85	6,008
1 m.	f.s.	Railton Special	Cobb	24	110	130	48,029
5 km.	f.s.	Railton Special	Cobb	24	140	130	48,029
5 m.	f.s.	Railton Special	Cobb	24	140	130	48,029
10 km.	f.s.	Railton Special	Cobb	24	140	130	48,029
10 m.	f.s.	Railton Special	Cobb	24	140	130	48,029
50 km.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
100 km.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
200 km.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
500 km.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
1000 km.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
2000 km.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
3000 km.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
4000 km.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
50 m.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
100 m.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
200 m.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
500 m.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
1000 m.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
2000 m.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
1 hr.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
3 hrs.	s.s.	Mormon Meteor	Jenkins	12	130	158	25,351
6 hrs.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
12 hrs.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
24 hrs.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351

FOR DISTANCES OF

<i>Distance or Time</i>	<i>Start</i>	<i>Make of Car</i>	<i>Driver</i>	<i>Cyls.</i>	<i>Bore</i>	<i>Stroke</i>	<i>c.c.</i>
3,000 m.	s.s.	Mormon Meteor	Jenkins and Bergere	12	130	158	25,351
4,000 m.	s.s.	Mormon Meteor	Jenkins and Stapp	12	130	164	26,238
5,000 m.	s.s.	Mormon Meteor	Jenkins and Stapp	12	130	164	26,238
10,000 m.	s.s.	Citroën	Marchand & others	6	75	100	2,650
15,000 m.	s.s.	Matford-Yacco	Mme Descollas & others	8	78	95	3,631
20,000 m.	s.s.	Matford-Yacco	Mme Descollas & others	8	78	95	3,631
25,000 m.	s.s.	Austin Special Yacco	Marchand & others	6	79.52	114.50	3,405
30,000 m.	s.s.	Citroën	Marchand & others	6	75	100	2,650

SPEED RECORDS

4000 KILOMETRES AND 2000 MILES

<i>Time</i>		<i>Speed</i>		<i>Date</i>	<i>Place</i>	<i>Start</i>	<i>Distance or Time</i>	
<i>H.</i>	<i>M.</i>	<i>SEC.</i>	<i>M.P.H.</i>	<i>K.P.H.</i>				
0 00	19	08	117.3	188.7	26.10.37	Frankfort	s.s.	1 km.
0 00	6	05	369.7	595.0	23.8.39	Darmstadt (Utadit)	f.s.	1 km.
0 00	25	96	138.7	223.2	27.10.37	Frankfort	s.s.	1 m.
0 00	9	76	368.9	593.6	23.8.39	Salt Beds	f.s.	1 m.
0 00	34	24	320.7	525.8	26.8.39	Salt Beds	f.s.	5 km.
0 00	59	57	302.2	486.3	26.8.39	Salt Beds	f.s.	5 m.
0 1	19	04	283.0	455.5	26.8.39	Salt Beds	f.s.	10 km.
0 2	13	16	270.4	435.1	26.8.39	Salt Beds	f.s.	10 m.
0 10	46	82	172.91	278.2	22.7.40	Salt Beds	s.s.	50 km.
0 20	52	17	178.64	287.5	22.7.40	Salt Beds	s.s.	100 km.
0 41	06	45	181.38	291.9	22.7.40	Salt Beds	s.s.	200 km.
1 41	50	46	183.04	294.5	22.7.40	Salt Beds	s.s.	500 km.
3 30	12	79	177.35	285.4	22.7.40	Salt Beds	s.s.	1000 km.
7 12	33	69	172.39	277.1	22.7.40	Salt Beds	s.s.	2000 km.
10 56	17	36	170.29	274.0	22.7.40	Salt Beds	s.s.	3000 km.
11 47	19	20	163.96	270.4	22.23.7.40	Salt Beds	s.s.	4000 km.
0 16	55	47	177.25	285.2	22.7.40	Salt Beds	s.s.	50 m.
0 33	12	72	180.65	290.7	22.7.40	Salt Beds	s.s.	100 m.
1 05	41	98	182.61	293.9	22.7.40	Salt Beds	s.s.	200 m.
2 49	16	36	177.22	285.2	22.7.40	Salt Beds	s.s.	500 m.
5 17	12	84	172.80	278.1	22.23.7.40	Salt Beds	s.s.	1000 m.
11 44	23	95	170.35	274.1	22.7.40	Salt Beds	s.s.	2000 m.
<i>Miles</i>		<i>Yds.</i>						
182	902	182.51	293.7	22.7.40	Salt Beds	s.s.	1 hr.	
531	1689	177.32	285.3	22.7.40	Salt Beds	s.s.	3 hrs.	
1034	526	172.38	277.4	22.7.40	Salt Beds	s.s.	6 hrs.	
2042	973	170.21	273.9	22.7.40	Salt Beds	s.s.	12 hrs.	
3868	756	161.18	259.4	22.23.7.40	Salt Beds	s.s.	24 hrs.	

3,000 MILS AND OVER

<i>Time</i>		<i>Speed</i>		<i>Date</i>	<i>Place</i>	<i>Start</i>	<i>Distance or Time</i>	
<i>H.</i>	<i>M.</i>	<i>SEC.</i>	<i>M.P.H.</i>	<i>K.P.H.</i>				
18 05	34	63	165.81	266.84	22.23.7.40	Salt Beds	s.s.	3,000 m.
26 34	21	99	150.53	212.23	21-23.9.36	Salt Beds	s.s.	4,000 m.
33 27	46	61	119.42	210.47	21-23.9.36	Salt Beds	s.s.	5,000 m.
111 28	11	26	89.71	114.37	22.29.7.35	Monthléry	s.s.	10,000 m.
170 37	41	73	87.91	114.48	19-29.5.37	Monthléry	s.s.	15,000 m.
220 37	03	49	87.10	140.18	19-29.5.37	Monthléry	s.s.	20,000 m.
297 06	57	87	84.14	135.41	19.4 to 2.5.34	Monthléry	s.s.	25,000 m.
368 27	11	16	77.63	124.93	26.4 to 24.5.33	Monthléry	s.s.	30,000 m.

Motor Launch, see MOTOR BOATS.

Motor Law.—The Motor Car Act, 1903, and the Locomotives on Highways Act 1896, are the charter of the modern motor car, and the law as to registration of cars, licensing of drivers, regulation of lighting, and penalties for dangerous driving are to be found in those Acts, as amended by later Acts, and by regulations and by-laws made under the various Acts. A new system of licensing vehicles was introduced by the combined operation of the Roads Act, 1920, the Finance Act, 1920, and the Order in Council and Regulations made under the Acts. The issue of licences and the collection of excise duties are carried out by the co. councils and councils of co. bors. in the case of all first applications; but renewals can be effected by the councils or by any post office in the area of the first issuing council. Besides ordinary licences there were under the Roads Act, 1920, general and trade licences for manufacturers of, and dealers in, and repairers of mechanically propelled vehicles. These are replaced by 'A' and 'B' licences under the Transport Act, 1947 (q.v.). The ordinary car tax is 25s. per unit of h.p., but in the case of cars first registered after Jan. 1946 there is a flat rate tax of £10, whatever the h.p.

The licences are usually issued for a calendar year, but ordinary licences may be obtained for shorter periods, and the duty varies with the length of the period. Special terms are made for motor cycles, and cyclists may take out licences either for a single quarter or for any period less than a year, but greater than a quarterly period. The duty for general or limited trade licences varies according to the class of vehicle, but these may never be used when passengers are being carried for reward. Manufacturers may apply for a general licence applicable to all the vehicles used by them, the rate of duty being £10, except in the case of bicycles, for which the duty is 30s.; such licences are valid only for the use of one vehicle at a time. The licence card must be fixed to the vehicle so as to be clearly visible at all times by daylight. Registration is governed by the Registration and Licensing Order, 1921, and the regulations of 1924. The mark indicating the registering council and number must be fixed on every vehicle and its trailer (if it has one). The identification mark required by the Roads Act, 1920, is the index mark and regulation number assigned to the vehicle, and must be shown on a flat rectangular plate or similar surface forming part of the vehicle. Under the Road Traffic Act, 1930, it is an offence to drive or attempt to drive or to be in charge of a motor vehicle when under the influence of drink or a drug to such extent as to be incapable of having proper control, and the first offence is punishable by fine up to £50 or four months' imprisonment or both, and the second by fine up to £100 and (or) four months' imprisonment, or, if the proceedings are by indictment, by imprisonment up to six months. The defendant if convicted is automatically disqualified from driving for twelve

months and there is no power to defer the operation of the disqualification pending appeal. Particulars of the conviction must be endorsed on the licence. A person so disqualified may, within three months, apply to the same court to remit the penalty. Regulations were issued by the transport ministry in 1929 forbidding the use of cars on the highway which caused an excessive noise by reason of structural defect, faulty adjustment, etc. No one may drive a motor vehicle unless he holds a driver's licence, the fee for which is 5s. This licence must be produced to any police officer on request, but failure to do so does not mean conviction for an offence if the driver is subsequently able to do so within five days at a police station named by him. But the police officer has no power to take note of any endorsement or conviction appearing on the licence. No one under sixteen years of age may be granted a driver's licence, whether for a motor car or for a motor cycle.

The speed limit was abolished in 1930, but was restored by the Road Traffic Act, 1934, which provided for a limit of 30 m.p.h. in built-up areas. Reckless or dangerous driving, which is a statutory offence as well as an offence at common law, consists in driving 'recklessly or at a speed or in a manner which is dangerous to the public, having regard to all the circumstances of the case, including the nature, condition, and use of the road, and the amount of traffic which is actually at the time or which might be reasonably expected to be on the road.' The maximum fine is £50 or four months' imprisonment or, for a second offence, £100 or four months' or, on indictment, six months'. Disqualification from driving follows on a second offence, not automatically but is discretionary in the case of the first offence. A police constable may, when the offence is committed within his view, demand the name of the driver and the production of his licence and, in default, arrest him without a warrant. The Act of 1930 created the new offence of 'careless driving,' i.e. driving 'without due care and attention or without reasonable consideration for other persons using the road.' The penalties are £20 for the first and £50 or three months' imprisonment for a second offence, but disqualification from holding or obtaining a licence does not follow from either first or second offence. It is permissible to carry a pillion rider on a motor cycle provided such passenger sits astride upon a proper seat fixed to the machine behind the driver; but only a single passenger may be so carried. Other offences included in regulations are ignoring one-way street signs; parking for longer than the permitted time or in prohibited areas; ignoring traffic lights, police signs, and 'Bellsha beacons' (these beacons were removed during the Second World War, in order to use the metal for munitions, but have since been restored). Another innovation was the driving test for new drivers, to be taken during the first three months of driving, drivers being issued a 'Learner's Licence' and being compelled

to carry 'L' plates on their cars until they have passed the test. The Road and Rail Traffic Act, 1933, regulates the carriage of goods on roads by motor vehicles, and grants power to railway companies to arrange agreed rates. It also contains provisions as to the restriction of the use of roads and bridges. For taxation of motor cars see also CARRIAGE LICENCES. See INSURANCE, Casually and Contingency Insurance; TRANSPORT ACT, 1947; MOTOR VEHICLE INSURANCE.

Motor Signs.—For 10 m.p.h. or lower limit, a round white ring, speed in figures underneath. Prohibition, red solid disk. Caution, dangerous corners, cross-roads, steep gradients, hollow red equilateral triangle. All other notices to be on diamond-shaped boards.

See B. K. Parry, *Motorists and the Law*, 1931; E. Terrell, *Running Down Cases* (2nd ed.), 1936; H. Hughes, *Law relating to Road Users' Rights, Liabilities, and Insurance*, 1938; D. Potter, *Law relating to Garages and Car Parks*, 1939; L. Bingham, *Digest of Motor Claims Cases*, 1946; and A. D. Gibb, *Trial of Motor Car Accident Cases: their Preparation and Conduct* (3rd ed.), 1947.

International Convention on Motor Traffic, 1949.—Supersedes the obsolete 1926 convention on road and motor traffic and that on the unification of road signals of 1931. The new code is a comprehensive convention, worked out by a United Nations conference, and was signed in Geneva by delegates from thirty-six nations. The delegations, mostly composed of technicians and experts connected with motor transport and road usage, devised the new convention, starting from a draft prepared by the road transport section of the Economic Commission for Europe. The convention touches on almost every aspect of the motor car on the road and contains provisions which will affect car drivers, their registration, licences, and permits; manufacturers of private cars, lorries, omnibuses, trailers, motor cycles, and auxiliary cycles, cyclists and motor cyclists; road and bridge builders; and manufacturers of road signs and signals. It is intended for the guidance of govs. in planning their internal and international road systems. There is a main convention and a series of annexes, the latter divided into obligatory and optional undertakings. The provisions of the main convention are intended to be fixed provisions, whereas the annexes can be amended to keep them abreast of technical development. It is not proposed to set up a special international organisation for motor traffic. In most of its provisions the convention is intended to apply to international traffic only. Countries retain full jurisdiction over their own roads but agree to the use of certain highways for international traffic under the terms of the convention. The international road network is to be achieved gradually by regional arrangements. Although roads in the United Kingdom are scheduled as part of the system of European roads and are so marked on the road map, the Brit. delegation stated

that Brit. roads would not be designated as international highways nor would vehicles be permitted which did not conform to domestic regulations. In some cases acceptance of the convention will implicitly require states to enact new laws and alter national regulations to bring them into conformity with its requirements. The convention gives much consideration to its recommendations on the visibility, distance, and placing of road signs, especially in built-up areas. The convention accepts the customary traffic regulation lights of red, amber, and green. Rules are also laid down for overtaking, turning, entering priority roads, and traversing cross-roads. The motorists on the international highway in a foreign country will be familiar with much that is common ground; but he will still have a good deal to learn when these provisions come into force.

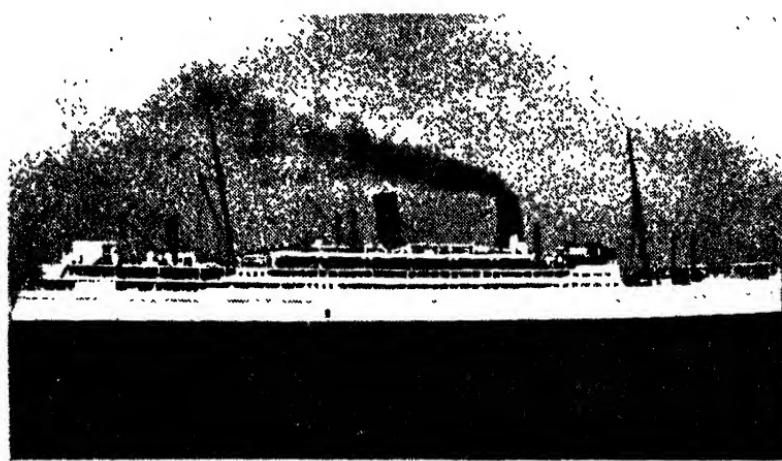
Motor Licensing, see MOTOR LAW.

Motor Ships. The term includes ocean-going craft usually of over 100 tons, powered mainly by internal-combustion engines. The advantages of the internal-combustion engine for marine propulsion are (1) the absence of boiler and attendant feed-pumps, feed-heaters, and filters, with consequent reduction in space occupied by machinery and in stowage; (2) easy bunkering, as the fuel (oil) can be stored in double-bottom tanks; (3) higher thermal efficiency, resulting in lower fuel consumption and therefore increased range of operation and saving in time and money.

Engines.—The engines used in modern M. S. are almost exclusively vertical reciprocating oil engines (q.v.) of the compression-ignition (Diesel) or the semi-Diesel type. Gas engines have been tried in smaller ships, but the space occupied by the gas producer offsets the advantage of the absence of boiler, but even so the gas engine is more efficient than the steam engine. Marine engines working on the four-stroke full Diesel cycle may be either single- or double-acting and are usually built in four-, six-, or eight-cylinder units. The best known are the following: the Burnmoor & Wain (Copenhagen) double-acting eight-cylinder type developing 1000 b.h.p. per cylinder, for large passenger liners, and the long-stroke six- or eight-cylinder unit for cargo boats. These types are built in Great Britain under licence by Harland & Wolff (Belfast) and John G. Kincaird & Company (Greenock). The Tosi single-acting engine, designed by Franco Tosi (Legnano) has a combined air-inlet and exhaust valve which is coupled to director gear, the heat stresses of the valve being relieved by the cool air. It is manufactured in Great Britain by Wm. Beardmore & Company (Glasgow) and Richardsons, Westgarth & Company (W. Hartlepool). The Werkspoor (Amsterdam) single- or double-acting engine has a 'balanced-bottle' gravity fuel feed, dispensing with fuel pumps on the engine; it is built in Great Britain by the North-Eastern Marine Engineering Company (Wallsend-on-Tyne) and by Hawthorn, Leslie & Company (Newcastle-on-Tyne). The Vickers

(Barrow-in-Furness) single-acting engine uses solid injection. Of engines working on the two-stroke cycle, the Sulzer (Winterthur) port-scavenging supercharging engine is the best known. It is built in Great Britain under licence by Vickers-Armstrong (Armstrong-Sulzer type), Fairfield Shipbuilding and Engineering Company (Glasgow, Fairfield-Sulzer type), A. Stephen & Sons (Linhouse, Stephen-Sulzer type), and John Brown & Company (Clydebank, Brown-Sulzertype). The Neptune engine, designed and built by Swan, Hunter & Wigham Richardson (Wallsend) is notable for the special design of cylinder covers and liners which reduces heat stresses. The North Brit. double-

hot-bulb engine is simpler and more compact, but owing to the low compression ratio the power developed per cylinder is much less than in the full Diesel engine, the maximum being of the order of 100 b.h.p. per cylinder, whereas the engine working on the full cycle may develop up to 1000 b.h.p. per cylinder. Semi-Diesels usually work on the two-stroke cycle with crankcase compression. The semi-Diesel is best suited to smaller craft and is usually manufactured in units of 50-500 h.p. A remarkable development is the Scott-Still engine, in which the exhaust gases from the engine are used to generate steam in a boiler and the boiler water circulates in the cooling-water jacket of



R.M.S. 'AORANGI' OF THE CANADIAN AUSTRALASIAN LINE (17,491 TONS)

acting engine, built by the North Brit. Diesel Engine Works (Glasgow), has reciprocating (sliding) cylinders. The scavenge inlet ports are uncovered by the movement of the cylinder, the covers being fixed, and exhaust ports are uncovered by the piston. A special type of two-stroke engine is the Cammellaid-Fullagar opposed-piston air-injection engine, in which two cylinders are arranged side by side, each having two pistons, the top piston in one cylinder being connected externally to the bottom piston in the other. Combustion in one cylinder, between the pistons, drives these apart, the bottom piston transmitting the power to the crank, while the external connections pull the pistons in the other cylinder together and an opposite impulse is given by the bottom piston to the other side of the crankshaft. A different principle is used in the Doxford opposed-piston engine, which uses solid injection. The bottom piston acts directly on the crank-shaft through the connecting rod and the upper piston acts on a crosshead at the top of the engine. The semi-Diesel or

the cylinder, being converted into steam. The steam is supplied to the cylinder of the engine under the piston, whereas the combustion of the oil fuel takes place as usual above the piston. The engine thus works as a two-stroke solid-injection internal-combustion engine above and as steam engine below the piston. Extra steam can be generated by oil burners under the boiler, and the engine may run as a steam engine only, or as an internal-combustion engine only, at reduced speed. The first Scott-Still engine was used (1924) on the 11,650-ton cargo liner *Dolins*, powered by two four-cylinder units (2500 b.h.p., 120 r.p.m.).

Drive. - As the most efficient speed of a propeller is below 100 r.p.m., direct coupling of the internal-combustion engine to the propeller shaft implies a long-stroke engine occupying a large space vertically. This is not important in a cargo vessel, but in passenger ships the deck space is needed for accommodation, and in any case the internal-combustion engine is most efficient at high speeds; a high-speed engine develops more power

than a slow engine of the same size and, for a given power required, costs less. It is therefore often expedient to use some form of indirect coupling. Indirect or transmitted drive may be mechanical, hydraulic, or electric. In mechanical transmission two or four engines are used, coupled to the main propeller shaft through gear wheels. In the hydraulic drive the energy is transmitted from the engine to the main shaft through impeller pumps with lubricating oil as working fluid. In electric transmission the engines are directly coupled to electric generators which supply power to separate motors driving the shaft. Both hydraulic and electric drive give freedom of manoeuvring and reversing independently of the prime mover, and electric transmission allows complete flexibility in arrangement and working of the engines. The engine room becomes in fact a power station supplying power to main and auxiliary motors and for heating, lighting, cooking, refrigerating, and other purposes, and since motors as well as other supplies can be easily and independently controlled from any distance, it becomes possible to concentrate the control of movement, speed, steering, and all other functions on the bridge.

Auxiliaries.—For driving the deck machinery and other auxiliaries steam is often used, generated in oil-fired boilers, especially in tankers where steam is required in any case for cleaning the tanks before filling and as the best means for driving the pumps. Where electric transmission to the main shaft is used, it is natural to employ electric power for driving the auxiliaries as well. Sometimes both steam and electricity are used. The choice of drive depends mainly on cost of equipment.

See A. W. Kircaldy, *British Shipping*, 1919; A. C. Hardy, *Motorshipping in 1932, 1933, and Motorships, 1933*; *The Motor Ship Reference Book*, 1913; G. S. Baker, *The Merchant Ship*, 1919; and *The Motor Ship* (monthly jour.).

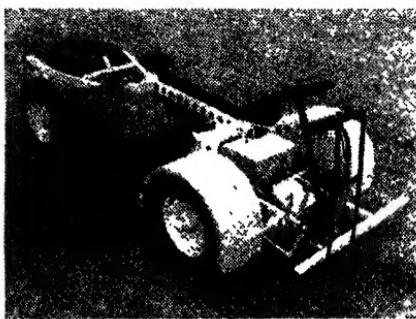
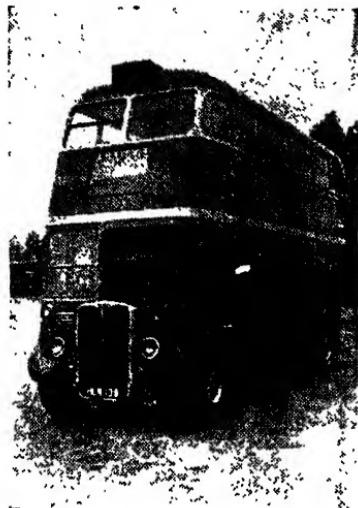
Motor Spirit. see PETROL.

Motor Transport, Commercial. The term covers the conveyance of goods or passengers by mechanically driven trucks, tractors, or hackneys (buses or cabs plying for hire) on the public road (not on rails). As early as 1833 Goldsworthy Gurney tried to run a passenger steam coach on the Birmingham road, and although experts such as Telford and Bryan Donkin reported favourably on the trials, and there were plans for establishing a steam omnibus on the Holyhead road, the experiment was soon abandoned owing to lack of public support. In 1865 an Act was passed with the intention of protecting horses and cattle on the roads by prescribing that road locomotives, such as were used for hauling threshing machines and rollers, should be preceded by a man carrying a red flag and should not exceed a speed of 4 m.p.h. As the term 'road locomotives' was found to apply to any mechanically propelled vehicle, the Act was practically a ban on motor traffic, although the law was often broken in the early days of motoring,

until it was finally repealed in 1896. The steam lorry soon made its appearance and continued to hold an important place for the conveyance of heavy goods up till about 1930, but is now almost completely replaced by the motor lorry. Some steam buses were used in London in 1905-6, and there were in all about 100 in the country. Meanwhile the internal-combustion engine had been developed to a stage where its application to large vehicles became practicable and in 1903-4 Thomas Tilling & Company introduced the motor bus in London. Though the earliest of these buses were built and engined by foreign makers, notably Daimler, the Eng. firms, Leyland, Crossley, Maudslay, and others, soon entered and finally conquered the market. The delay in development of tramway systems, partly if not wholly due to the fact that the busiest thoroughfares in many Eng. cities are unsuited to railboard traffic, has its counterpart in the quick adoption of an extensive bus service with vehicles of superior design. In 1904 the motor law was overhauled, and in 1910 the Road Board was set up to co-ordinate research and to administer the Roads Improvement Fund arising out of motor-car licences and the tax on motor spirit. Already in 1902 a private Road Improvement Association had been formed, supported by cyclists and car owners for carrying out research on dustless roads and road surfaces. The new board now applied the results of these investigations, and by 1913 England had a greater mileage of excellent dustless roads than any other country. By that time extensions of London's bus routes reached Windsor and Barnet, and local country services linked vls. to the larger tns. and railway stations, but large-scale developments and estab. of long-distance routes belong to the years 1920-35.

A select committee of the House of Commons was set up in 1904 to inquire into the licensing of cabs in London, and when the report was presented in 1906 there were fifty-two motor hackney carriages. By 1913 the horse-drawn cab had almost vanished from the streets.

The development of the network of bus routes which now covers nearly the whole country had had a marked effect on the distribution of population. City workers have been enabled to live on the outskirts of large tns., travelling to and from their office or other place of work in comfort, and to benefit from the better housing conditions available, and the tns. have been relieved of some of the overcrowding. At the same time, the replacement of horse-drawn vans by motor vans and lorries of vastly increased range of operation has had repercussions on business organisation and the distribution of goods. Direct delivery from the factory, in a single journey without reloading on to trains, has become possible over long distances and has led to estab. of branch factories and distribution centres. As far as passenger transport is concerned, the modern tendency is to use double-deck buses with up to sixty seats for



CHASSIS OF 'BRUSH' BATTERY ELECTRIC VEHICLE

10½ cwt.; 9·8 h.p.; cruising speed, 16 m.p.h.; series-parallel battery control system.

Left. A.E.C. DOUBLE-DECKER BUS

A E.C. 9.6 litre, 125 b.h.p. oil engine; fluid transmission, compressed air brakes; 56 seats; max. speed 40 m.p.h.

local traffic, with frequent stops and change of passengers, and single-deck buses for twenty to forty passengers for long-distance express journeys with less frequent stops. The wheel-base is about 14-20 ft. and there may be four or six wheels, with twin rear tyre equipment. The Bedford twenty-six to thirty-seat single-decker still uses the petrol engine, but the six-cylinder oil engine (compression-ignition) is generally favoured. The B.M.M.O. single-deck forty-seater has a six-cylinder compression-ignition engine mounted flat between the two axles, but usually the engine is mounted in front, next to the driver's seat. A four-speed gear-box, a 24 V generator and starter motor, and a 185 Ah battery is usual. On some Crossley models, the Brockhouse transmitter is a hydraulic torque converter replacing the flywheel, clutch, and gearbox.

For delivery of goods of small bulk the cycle-and-sidecar outfit is sometimes used. The electric van, with battery-driven series motor, is ideal for t.n. deliveries; it has excellent starting and control characteristics, a speed of about 16 m.p.h., and a range of 40 m. before recharging the battery. The Karrier 'Bantam' is a 2-ton vehicle with a four-cylinder petrol engine. The Austin 'Ten', and the Morris, also with four-cylinder engines, of about 25 h.p., are closed vans of about 120 cub. ft. capacity. The large six- or eight-wheel lorries usually have six-cylinder oil engines and are often provided with drop-sides or drop-back for loading and unloading, while some have hydraulically operated tipping arrangements. Tankers of 2500 gal. capacity can be mounted on A.E.C. 'Mammoth Major' chassis. The articulated or trailer type

of lorry consists of a three- or four-wheel short section carrying the engine and driver's cabin, the rear wheels being driven—sometimes called the mechanical horse—and with arrangements for coupling to a trailer, which may be a closed van or an open lorry, with two or four wheels, or sometimes a tank. The production of commercial motor vehicles in Great Britain, which had reached 100,000 per annum in 1935, dropped considerably when military requirements became urgent, but is now (1948) at the rate of 170,000 per annum. In 1946 the number of current licences was: goods vehicles, 563,000, including 8000 electrically propelled and 1000 steam and gas vehicles; agric. tractors and engines, 146,000. In addition to the above there are certain cars that fall under the description 'commercial,' which are connected with public services and pay no taxes. These are chiefly ambulances, fire-engines, road rollers, and cars attached to the gov. depts. In 1946 they were numbered in Great Britain at 61,000. The total number of goods vehicles increased from 463,000 to 563,000 between 1936 and 1946. Much of this development has been due to the increasing use of motor vans by retail distributors and to the improvement in the upkeep of roads and the construction of wide arterial thoroughfares. Local authorities received £13,842,000 from the state for highways and bridges in the year 1938-39, and expended £50,392,000. It is stated that unsuitable bridges now constitute a greater barrier to further developments than the strain upon road accommodation. In 1944-45 the gross receipts from taxation were £235,409,796 (including miscellaneous receipts of £1,061,498). The numbers of



Vauxhall Motors Ltd.

BEDFORD 2-3 TON TIPPING LORRY

28 h.p. six-cylinder truck engine; maximum angle of tip, 15°-50°

vehicles and gross taxation were as follows: cars taxed on h.p., £1,473,742, £16,235,930; motor cycles, 307,787, £640,496. "Goods vehicles, (a) agric. vans and lorries, 28,102, £347,508; (b) showmen's special vehicles, 1962, £72,380; (c) other kinds of goods vehicles, 447,992, £12,353,788. Agric. engines, 130,507, £32,236. Traders, (a) agric., 512, £3272; (b) general haulage, 2506, £97,060; (c) motor hackneys, 98,198, £4,204,736; (d) tramcars, 6203, £4669. Gross tax receipts in 1945-16 on mechanically propelled road vehicles were: goods vehicles, £14,038,000; tractors, £125,150; motor hackneys, £4,524,290. The total gross tax receipts in 1945-16 for mechanically propelled vehicles were £45,265,576, of which motor cars and cycles accounted respectively, for £23,615,305, and £1,200,889.

See J. H. Clapham, *The Economic History of England*, 1926; E. Molloy, *Modern Oil Engine Practice*, 1942; S. M. Hills, *Battery Electric Vehicles*, 1913; M. M. and G. W. Williamson, *The Commercial Motor Vehicle*, 1948; and L. D. Kitchin, *Bus Operation*, 1949.

Motor Transport, Military. Not only has the petrol motor van superseded the horse-drawn vehicle for conveyance of ammunition and supplies in modern armies, but the possibilities of transporting large numbers of men rapidly over long distances, while keeping them supplied, and maintaining contact with headquarters through telecommunication installations and by means of motor-cycle dispatch riders, have had far-reaching effects on strategy and tactics. At the same time, the use of the tank, Bren-gun carrier, and other combat vehicles, not considered here, has necessitated provision of mobile workshops, fuel supplies, and the like, only feasible by motor transport. The mechanisation of armies is still in the process of development, but certain types of motor vehicle have become standardised in the Brit. Army, at least for the time being. The motor cycle (*q.v.*) is used both in the army and the air force for dispatch-riders, for scouting, etc., often with sidecar, especially in action, as three wheels are safer than two. The combination is known in the army as a 'three-motor-bike.' The staff car is an ordinary motor car seating five officers and used for maintaining personal contact between head-

quarters and the troops. The following types are used as open or canvas-enclosed vehicles. The 'dingie' is a small light car with room for one beside the driver and six men seated (sideways) at the back. The 15 cwt. can carry twenty men at the back, ten seated and ten standing down the middle; the 30 cwt. carries thirty men. The 3-ton Leyland also carries thirty men, and drive can be applied to all four wheels when in difficulties. The 10-ton lorry has six or eight wheels and the drive can be applied to six wheels. It can be automatically coupled to a trailer carrying a tank, an aeroplane, or other heavy and bulky object. Besides these there are special vehicles carrying telecommunication installations, workshop equipment, cranes, etc., and a large fleet of ambulances. See also MECHANISATION.

Motor Vehicle Insurance may be effected to cover loss or damage to cars, for the death of or injury to other persons, and for damage to property when the car is driven by the owner or by another, but insurance against third-party risks is compulsory under the Road Traffic Act, 1930. Under this Act a person may not use or permit any other person to use a motor vehicle on the road unless such use is covered by insurance (or security) against third-party claims, in respect of death or bodily injury. Damage to property is excluded. This does not require the owner to cover a person in his employ against death or bodily injury arising out of, and in the course of his employment, a liability which is covered by other statutes. In this connection it is important to note that some insurance policies are invalidated if the driver is unlicensed at the time of an accident. Where compensation is paid under the provisions of compulsory insurance, and where to the knowledge of the insurer a third party has received hospital treatment, the insurer shall also pay to the hospital the 'expenses reasonably incurred' for the person treated.

When applying for a car licence the car owner must satisfy the licensing authority either that he is, or will be by the time the car licence becomes operative, covered against third-party risks. Under the terms of a policy relating to a specified motor car, the owner is entitled

to drive any other motor vehicle than that specified and the insurance company shall on demand issue to him a further certificate of insurance. A person engaged in the business of letting motor vehicles on hire is not required to produce his certificate if the vehicle is intended to be used solely for the purposes of hire and driven by the person by whom the motor vehicle is hired. Drivers must produce insurance certificates when requested by the police. Compulsory insurance does not apply to vehicles owned by local authorities; the police; a person who deposits £15,000, as cover by security, with the accountant general of the supreme court. This exemption is confined to the vehicle driven by the owner, or by a servant or another subject to the control of the owner. In America insurance of motor vehicles is conducted on similar lines to those adopted in England, but in the case of insurance against third-party risks the liability of the insurance company does not usually exceed \$5000. See also under INSURANCE, *Casualty* and *Contingency Insurance*.

Motril (anc. *Firmium Julium*), tn. of Granada prov., Spain, 1 m. from the Mediterranean. It was the anc. port of Granada. Silk, sugar, wine, and fruits are produced; lead and antimony are mined. Zinc and copper are also found, and there are iron foundries. Moorish ruins remain. Pop. 17,000.

Motte, Jeanne Marie Bouvier de la, see Guyon, Mme.

Motteux, Peter Anthony (Pierre Antoine) (1660–1718), Fr. *littérateur*, settled in London as a Fr. Huguenot merchant on the revocation of the edict of Nantes (1685). He wrote dramas, including *Norely* (1697) and *The Amorous Misér* (1705). M. trans. *Don Quixote* into Eng. and Rabelais's works with Urquhart and Ozell. See T. Cibber, *Lives of the Poets*, 1753, and D. Baker, *Biographia Dramatica* 1812.

Mottistone, John Edward Bernard Seely, first Baron (1863–1947), Brit. politician. Educated at Harrow and Trinity College, Cambridge; called to the Bar in 1897. After service in the S. African war he became an M.P., changing from Conservative to Liberal. By 1912 he was secretary of state for war, losing the post in 1914 over the 'Curragh Incident'. During the First World War he reached the rank of major-general. Under-secretary for air in 1919, he resigned over the gov. refusal to separate the air service from the War Office, a step taken later. His pubs. include *Adventure* (1930); *Fear and be Slain* (1931); *For Ever England* (1932); and *Oaths of Happiness* (1938).

Mottram, Ralph Hale (b. 1883), Eng. novelist, b. at Norwich, Oct. 30. He was educated in Norwich and London; employed in Barclay's Bank and then served on the W. front. His war experiences in Belgium inspired the admirable novel or quasi-novel entitled *The Spanish Farm* (1924, later issued with other related novels as *The Spanish Farm Trilogy*), the chief female character in which may be said to personify Belgium through the ages

In this work M. may be said to have set the standard for war books of a pseudo-fictional type, as literature. *Sixty-four*, *Ninety-four*, and *The Crime at Vandervinden's* combine with *The Spanish Farm* to form a trilogy. Other books are *Our Mr. Dormer* (1921); *The English Miss* (1928); *Ten Years Ago* (1928); *The Boroughmonger* (1929); *A History of Financial Speculation* (1929); *Europa's Beast* (1930); *Poem's Old and New* (1930); *Castle Island* (1931); *The Headless Hound* (1931); *Home for the Holidays* (1932); *Early Morning* (1935); *Old England* (1937); *Traders' Dream* (1939); *The World turns Slowly Round* (1942); *Burton the Liberator* (1946); and *The Gentleman of Leisure* (1947).

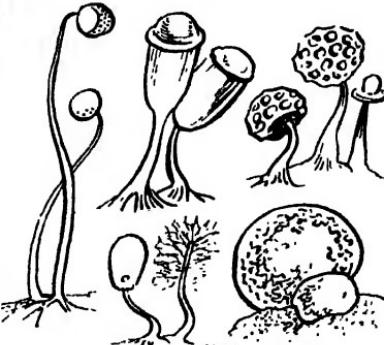
Motul, vil. of Yucatan state, Mexico, 30 m. E.N.E. of Mérida. Pop. (com.) 21,000.

Mouflon, species of wild sheep (*Ovis musimon*), formerly common in Spain, but now restricted to Corsica and Sardinia. It is some 28 in. high at the withers, or about the size of a common sheep, and the wool of the upper parts is brownish-grey with a dark dorsal streak and white on the legs and face. Horns are present in the males only and the tail is very short. The ram's curved horns are sometimes as much as 3 ft. in length. The M. breeds freely with the domestic species. See also under SHEEP.

Moukden, see Mukden.

Mould, see Soil.

Mould, general unscientific name for a variety of thread-like fungi, which in the presence of damp attack many kinds of



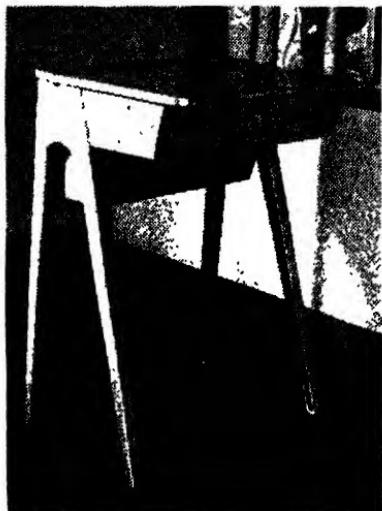
MOULDS

Drawn to ten times their natural size.

animal and vegetable substances. *Penicillium glaucum* and *Pithomyces*, the blue, green, or brown Ms. of oranges and other fruit, can only gain a hold when the skin or rind of the fruit has been slightly damaged.

Moulding, or Die-casting. Die-casting may be applied to any casting produced from a metal mould or die. 'Pressure' die-casting is employed to advantage when the component to be manufactured is in large quantities and of the thin wall

section. It consists chiefly of pumping molten metal into a steel die or mould under carefully regulated conditions. There are two types of pressure die-casting machines, i.e. hot chamber and cold chamber. The former has an integral furnace, and the metal is injected automatically, usually by air pressure. This method is generally used for zinc and other low-temp. melting metals. In the cold-chamber machine the molten metal



Educational Supply Association
A MOULDED SCHOOL DESK

Pressure die moulded in light alloy.

is ladled from a separate furnace into the machine, which injects it into the dies at great pressure. This process is repeated approximately every minute. The castings produced by this method are of such accuracy as to require little further treatment prior to being finished before final assembly. This method is generally used for aluminium, brass, and other high-temp. melting metals. Gravity die-casting is employed if the casting is large and beyond the range of the die-casting machines; in this method the metal is poured into the mould, and not injected under pressure. Practically all types of non-ferrous metals can be die-cast, the four main metals in use to-day, in order of castability, being zinc, magnesium, brass, and aluminium. The die-casting industry is rapidly expanding, and is widely used in the motor, radio, and electrical trades, and more recently in the manuf. of furniture components.

Mouldings, in architecture, any assemblage of narrow surfaces projecting from the face of a wall or other surface and advancing one beyond the other. They are bounded by straight lines, either hori-

zontal or vertical, according to their situation, but the surfaces themselves are plane or curved, and if the latter, concave or convex, or else compounded of both forms; and again are either plane or curved. M. are distinguished by different names, according to their profiles, their sizes, or their situations. Thus the *fillet*, *tenuia*, and *band* are all plane or flat mouldings. The *corona* is also a mere plane band, except that it is occasionally enriched in Rom. architecture. Lesser convex M. are termed *beads*, but the longer M. of the same kind in the bases of columns are termed *tori* or *torusses*. The *cyma recta*, or *cymatium*, is a compound moulding, concave above and convex below; while the *cyma reversa* is convex above and concave below. The *cavetto* is a mere hollow or sweep intervening between and serving to connect two M., one of which projects beyond the other. The *ovolo* is a simple convex moulding, so called because it is generally carved into *ora*, or ornaments in the shape of eggs, within hollows. All the other M. may be carved or enriched, except the cavetto and fillet, the pattern being accommodated to the surface of the M. The *cyma recta*, or *talon*, as it is sometimes called, is cut with a peculiar kind of tongued or arrow-headed ornament. In regard to Grecian M., it remains to be observed that many of those which are uncarved were painted with some ornamental pattern, and not unfrequently in the most brilliant colours.

Moule, *Le*, tn. in the Fr. colony of Guadeloupe, W. Indies, with a port on the N.E. coast of Grande-Terra. Sugar, coffee, rum, and logwood are exported. Pop. (com.) 11,000.

Moulin Rouge, Parisian place of entertainment, opened in the Boulevard de Cligny, Oct. 9, 1889, destroyed by fire Feb. 28, 1913, and rebuilt in 1921. It received its name from the windmill over the entrance, the sails of which were illuminated by red lights.

Moulins, *Giants' Kettles*, or *Cauldrons*, the popular names for a glacial pot-hole. These cylindrical holes were caused in rocks by subglacial streams, laden with gravel. There are examples in the Alps and Germany.

Moulins (anet. *Molinis*), cap. of the dept. of Allier, France, on the Allier, which has an arched bridge (1750-63) at this point. It contains the ruined castle of the Bourbon dukes, and a cathedral (founded fifteenth century, completed nineteenth century). M. forms a suffragan bishopric of Sens. Manufs. textiles, hats, cabinets, and machinery. Pop. 23,300.

Moulmein, seaport and the cap. of the Amherst dist., Lower Burma, 30 m. N. of Amherst. Exports include rice and cotton, and shipbuilding is carried on. It suffered heavy Jap. air attacks on Jan. 10 and 17, 1942, and was evacuated on Jan. 31 by the Brit. garrison after fierce Jap. assaults of the previous day. Pop. 63,500.

Moultine, general term for the habit in a large variety of animal types of shedding, periodically, the outer covering of feathers, hair, skin, cuticle, etc. In common usage it refers to the ann. renewal of birds'

feathers, which usually follows the completion of parental duties.

Moulton, Mrs. (née Ellen Louise Chandler) (1835-1908), Amer. novelist and poet, married to W. Moulton, a Boston publisher (1855). She was for long Boston correspondent on literary topics for the *New York Tribune*. Her works include *This, That, and the Other* (1854); *Juno Clifford* (1855); *Bed-time Stories* (1873); *Some Women's Hearts* (1874); *Firelight Stories* (1883); and *In the Garden of Dreams* (1890). See life by Lillian Whiting, 1910.

Moulton of Bank, John Fletcher Moulton, Baron (1844-1921), Eng. lawyer, b. at Madeley, Shropshire. Graduating as senior wrangler and Smith's prizeman in 1863 at Cambridge, he was called to the Bar in 1874, establishing the leading practice in patent law, on which he was recognised as a supreme authority. He took silk in 1885 and sat as a Liberal member of Parliament for Clapham, 1885-86, S. Hackney, 1894-95, then Launceston until 1906, when he became a lord justice of appeal. In 1912 he became one of the lords of appeal in ordinary and received a life peerage. Being expert in science as well as in law, he was, in the First World War, director-general of explosive supplies to the Ministry of Munitions.

Moultrie, John (1799-1874), Eng. poet, b. in London. He entered the Church and was rector at Rugby from 1825 to his death, during the time Thomas Arnold was headmaster. In 1864 he became canon of Worcester. His collected works were pub. in 2 vols. in 1876. His best poems were *My Brother's Grave* (1820) and *Godiva* (1820), and he also wrote *The Dream of Life* (1843); *The Black Fence* (1850); *St. Mary* (1850); and *Allars, Hearths, and Graves* (1854). See J. Julian (ed.), *A Dictionary of Hymnology*, 1892.

Moultrie, co. seat of Colquitt co., Georgia, U.S.A. It is the centre of an agric. area, has meat-packing plants, saw mills and cotton mills, as well as manuf. of clothing and turpentine. Pop. 10,200 (about 40 per cent Negroes).

Mound Birds, or Mound Builders (*Megapodes*), remarkable family of gallinaceous birds, which are so called on account of their habit of throwing up large mounds of vegetable matter in which they deposit their eggs, which they cover up and then leave to be incubated by the heat produced by fermentation. In some cases the mounds are co-operative. The species number only about twenty, and are characterised by very large feet, short tail, and crested head. A familiar example is the brush-turkey (q.v.).

Mound Builders, prehistoric inhab. of N. America, who lived mainly in the valleys of the Mississippi and Ohio. There are various opinions about their identity, but the generally accepted view now is that the Indians are their descendants, and that they belong to the Stone Age. They appear to have surpassed the Indians (when first met by the whites) in civilisation, and made very beautiful objects of stone, shell, bone, and beaten metals. But the most wonderful works of their hands were the earth mounds from which

they receive their name. These vary in shape, being round, conical, or in the shape of animals, and are scattered all over the country between the Alleghany and Rocky Mts., but chiefly in Ohio, Illinois, Indiana, and Missouri. The most famous mound in Ohio is the Great Serpent in Adams co., near Bush Creek. This, a gigantic serpent made in earth, measures 1348 ft. in length and is 5 ft. high. Wisconsin, too, contains some mounds in the shape of animals, some of which are of gigantic size. These, generally known as effigy mounds, were probably objects of worship as guardians of the vils. In Tennessee other kinds of mounds found contain one or more graves, varying in size, made of slabs of stone set on edge.



MOUNTAIN ASH, OR ROWAN

Mound Dwellings, underground or semi-underground dwellings which were at one time very widespread. Certain M. D. are of prehistoric date, while others were occupied even in recent times. In Scotland there are many varieties, numerous instances being found on the coasts of almost all the Orkney Is. On the Arctic shores of N.E. Siberia, the hyperborean race of the Onkilon dwelt in earth huts, half sunk into the ground, in the form of small mounds covered with a thick layer of earth. Similar to these were those used by the former natives of Kamtschatka and the Aleutian Is., and the winter dwellings of the Greenland Eskimos were practically identical. M. D. were usually circular or oblong in shape, had the appearance of a large rounded hillock, and were entered by a low narrow passage.

Moundsville, co. seat of Marshall co., W. Virginia, U.S.A., on the Ohio at the mouth of Grave Creek, 12 m. S.W. of Wheeling. Manufis. include glass, bricks, enamel ware, whips, and cigars. Pop. 11,200.

Mountain, tn. of Dundas co., Ontario, Canada, 30 m. S.S.E. of Ottawa.

Mountain Ash, tn. of Glamorganshire, Wales, 4 m. S.E. of Aberdare. It is included in the parl. bor. of Merthyr Tydfil.

There are iron foundries, water and gas works, and collieries near. Pop. 10,500.

Mountain Ash, or Rowan (*Pirus aucuparia*), handsome flowering tree of the family Rosaceæ, with pinnate leaves and large corymbose cymes (see INFLORESCENCE) of small cream flowers, which are followed by small fleshy scarlet berries with yellow flesh; these have a bitter acid flavour, and are much eaten by birds. They have been dried and ground into a kind of flour. The tree reaches a height of from 10 to 30 ft., and its tough wood has numerous uses.

Mountaineering. The awe and inspiration associated with mts. are well illustrated in the O.T. and in the Grk. classics; men feared them and generally avoided them. M. in the modern sense means the ascent of high mts. for sport and adventure; it is a product of the nineteenth century, whose possibilities were discovered and developed mainly by men in sedentary occupations to whom it offered refreshment of mind and body, an escape from the social duties and restrictions and the monotony of urbanised life. Ascents of high mts. previous to the eighteenth century were rare and made by exceptional men. Trajan viewed the sunrise from Etna, Petrarch for moral inspiration on Mt. Ventoux near Avignon. Bonifacio de' Rotari climbed the Rocca Melone (11,600 ft.) in 1358 on a pious mission. Leonardo da Vinci made scientific observations on a snowfield below Monte Rosa, the Mont Aiguille in Dauphiné was climbed with ladders in 1192 at the request of Charles VIII. of France. Conrad Gesner, Josiah Simler, and others wrote enthusiastically in the sixteenth century of the pleasures of walking on the mts. round Zürich. The exploring spirit of the eighteenth century and the advance of scientific knowledge began to remove the fear and reveal the attractions of mts. as a new field of inquiry. Pocock and Windham in 1741 appear to have set a fashion by their visit to the glaciers of Chamonix. In 1770 the Buet (10,200 ft.) was climbed by the brothers De Luc; a canon of the St. Bernard, L. J. Murith, climbed the Vélan (12,350 ft.) in 1779. But the great figure in M. hist. of the eighteenth century is H. B. de Saussure. In 1760 he offered a reward for the ascent of Mont Blanc. After sev. attempts the summit was reached by a young doctor, M. G. Paccard, accompanied by the guide Jacques Balmat, in 1786. Saussure himself, with his valet and eighteen guides made the third ascent in 1787. Col. Beaufort made the first ascent by an Englishman a few days later. For more than fifty years Mont Blanc monopolised the attention of the adventurous; those who climbed it rarely climbed other high mts. and all tried to give some scientific justification for their temerity. An exception was Mlle Henriette d'Angeville, who made the first ascent by a woman tourist in 1838. Albert Smith's ascent (the thirty-sixth) in 1851, illustrated by a panorama in London, did much to popularise the knowledge and nothing to lessen the perils of the undertaking.

Meanwhile occasional ascents of an exploratory character had been made in other parts of the Alps. For many years a monk, Placidus à Spescha, had been exploring the peaks round Disentis and almost reached the summit of the Tödi in 1824. The Gross Glockner was climbed in 1800 by a party including Horrasch, a priest, the Ortler in 1804 (Joseph Pichler), the Jungfrau (the brothers Meyer) in 1811, the Finsteraarhorn (Leuthold) in 1829. Among early Eng. explorers J. D. Forbes and John Ball (the first president of the Alpine Club) did notable work in the decade 1840-50. M. as a sport is generally dated from the ascent of the Wetterhorn from Grindelwald by Alfred Wills in 1854. In the decade 1855-65 almost all the great peaks of the Alps were climbed. The Matterhorn defeated many attempts before its conquest by Edward Whymper in 1865; four of the party were killed on the descent, and this tragic event gave a temporary check to adventurous M. in the Alps. The Eng. Alpine Club was inaugurated in 1857, and under the editorship of John Ball pub. *Peaks, Passes, and Glaciers* in 1859, a second series following in 1862. The first number of the *Alpine Journal*, with accounts of climbs and explorations by members of the club, appeared in 1863. Among its early members who pub. books and made many first ascents are T. Hinchliff, E. Whymper, Prof. Tyndall, Sir Leslie Stephens, Sir Alfred Wills, and Charles Mathews. The Austrian Alpine Club was founded in 1862, the Swiss and It. in 1863, the Ger. in 1869, the Fr. in 1874. All these early ascents of the great Alpine peaks were led by Swiss guides, many of whom found guiding a lucrative addition to chamois-hunting. Melchior Anderegg and Christian Almer were the two greatest of many fine Oberland guides of this early period; Auguste Balmat, Michel Croz, and François Devouassoud three of the best Chamonix men. The conquest of the main peaks left only minor peaks or new and more difficult routes for those who wished to combine exploration with adventure in the Alps. Equipment improved; even for the amateur the ice-axe was becoming a shorter and handier instrument that replaced the alpenstock. Climbs showing the advance in M. were: in 1876 the Mutterhorn, in 1879 the Meije, both by parties of three Englishmen without guides; in 1885 the traverse of the Meije by the brothers Zsigmondy and Purtsehler; the Dru in 1878 by C. T. Dent; the Zaunüe and Furggen ridges of the Matterhorn, and the Grépon by A. F. Munro, all three with the famous guide Alexander Burgener; the traverse of Mont Blanc via the Aiguille Blanche de Peuterey by Dr. P. Güssfeldt with Emil Rey and Christian Klückner. Men of sufficient means and leisure began the serious exploration of other great ranges than the Alps. In 1868 D. W. Freshfield, A. W. Moore, and C. C. Tucker went to the Caucasus with François Devouassoud and climbed Elbruz (18,500 ft.) and Kusbek (16,500 ft.). E. Whymper in 1879-80 climbed Chimborazo (20,700 ft.) and other

mts. of Ecuador. W. S. Green visited the New Zealand Alps in 1882, the Selkirks in 1888. In 1883 W. W. Graham with two Swiss reached a height of nearly 24,000 ft. on Kabru in Sikkim. By the end of the nineteenth century nearly every great range in the world had its M. hist.



T. Graham Brown

THE BREVA FACE OF MONT BLANC, FROM THE TOUR RONDE

A, Mont Blanc; B, Col Major; C, Mont Blanc de Courmayeur; S, Red Sentinel Rock (Sentinelle rouge); N, outward end of Breva snow arête; Y, bay of Breva glacier.

The photograph shows four routes: 1, left hand, via della Pera (Pear route), ending at C; 2, left centre, Route Major, ending at B; 3, right centre, Sentinel route, ending at A; 4, right hand, by N (Moore's arête), Breva route.

E. A. Fitzgerald by a visit in 1895, and the New Zealanders Fife, Mannerling, and Harper, continued exploration of the New Zealand Alps; Aconcagua (23,000 ft.) was climbed by Fitzgerald's guide Zurbriggen in 1897; Illimani (22,000 ft.) by Conway in 1898; Kilimanjaro (19,600 ft.) by

Meyer and Purtzscheller in 1889; Kenya by MacKinder in 1899; Mt. St. Elias (18,200 ft.) in Alaska by the duke of the Abruzzi in 1897; Pioneer Peak (22,500) in the Karakorams by Conway in 1892; A. F. Mummery with two Gurkhas lost their lives below Nanga Parbat in 1895. In the early years of the present century amateurs and guides continued to push up the standards of technique to the limits of what was possible without the artificial aid of hammer and pitons. With Joseph Knubel, G. W. Young and H. O. Jones climbed Mont Blanc by the Brouillard ridge, traversed two difficult ridges of the Grandes Jorasses and the Grépon from the Mer de Glace, all in 1911. In 1906 on the S. face of the Taschhorn, Franz Lochmatter saved the party containing Ryan and Young by a feat of rock-climbing unsurpassable without pitons. Guideless climbing especially among the Austrians, Germans, and Swiss, reached the standards of all but the very best guides. Fifty years after the formation of the Alpine Club there were more than 120 M. clubs in all parts of the world. In ranges outside Europe the climbing of Mt. Robson (12,900 ft.) by MacCarthy in 1913, and of Trisul (23,350 ft.) by Longstaff in 1906, are landmarks in the exploration of the Rockies and the Himalayas. The peaks of Ruwenzori were climbed by the duke of the Abruzzi in 1906. The first years of the period between the wars of 1914-18 and 1939-45 saw a great revival of Fr. M. activity. J. and T. de Lépinay and others made new and difficult ascents in the Mont Blanc dist. and inaugurated the Groupe de Haute Montagne. In 1927-28 F. S. Smythe and T. Graham Brown began the series of new climbs on the Brenva face of Mont Blanc. Tentonic climbers made increasing use of pitons, clasp-rings, and rope stirrups to ascend rock faces impossible without them; the Zdarsky sack and the igloo could make a night out at high altitude comparatively harmless. International rivalries and the encouragement by certain govs. of very daring feats as a stimulus to militancy and the desire for dominance led sometimes to a disregard of unavoidable risk from stonefall or bad weather, notably on long face climbs, such as the E. and S. faces of the Matterhorn (1931), the N. faces of the Eiger and Grandes Jorasses, climbed only after sev. attempts ending in tragedy, the former in 1938, the latter in 1935. Armand Charlet, Alexander Graven, André Roch, and Hermann Steuri maintained the supremacy of the best guides in speed and skill and the Swiss continue to distinguish between recklessness and courageous enterprise. In the last years of the 1939-45 war and after, a tendency to regard M. as an opportunity for self-immolation rather than a recreation has been noticeable in climbs by Frenchmen on the faces of the Grandes Jorasses and the Dru and elsewhere, and even in their Alpine literature. New climbs in the New Zealand Alps by H. E. L. Porter in 1924-1925 and the ascent of Mount Logan (19,700 ft.) by MacCarthy in 1925 were incidents in continued activity in the W.

hemisphere, but the Himalaya have been the scene of greatest M. interest in recent years. A route to the highest part of Everest (*q.v.*) was found by the reconnaissance of 1921, but after six more expeditions, most of them elaborately equipped, in 1922, 1924, 1933, 1935, 1936, and 1938, Everest is almost certainly unclimbed. Norton in 1924, Smythe, Wager, and Wyn Harris in 1933 reached a point about a thousand feet below the summit (29,140 ft.). In 1924 G. H. Leigh-Mallory and Irvine were seen by Odell ascending close to the ridge at about 28,000 ft.; it is unlikely that they passed a very difficult step at about 28,300 ft., and they were never seen again. On Kangchenjunga Paul Baner's party reached 24,200 ft. in 1929 and 26,000 ft. in 1931; Kanchenjunga (25,400 ft.) was climbed by Smythe's party in 1931; Nanda Devi (25,660 ft.) in 1936 by Tilman and Odell in a party led by Graham Brown, with Lloyd, Houston, Loonis, and others; it is the highest summit yet reached. Nanga Parbat (26,600 ft.) defeated four Ger. attempts in 1932, 1934, 1937, and 1938. Chomolhari (23,900 ft.) was climbed by Spencer Chapman in 1936. Many ascents and much exploration was carried out by E. Shipton in the years before 1939, continuing and extending previous work by Bruce, Visser, the Workmans, and many others. M. has developed in the present century the inevitable systematic organisation of a popular sport. Experts equipped with rubber shoes and nylon ropes lead and instruct pupils on the rocks of N. Wales, the Lakes, and the precipices of the Highlands, where they learn modern technique and the correct classification of climbs by difficulty up to 'very severe.' The M. Association has been formed to provide training schools in suitable areas of Britain. The B.M.C. (Brit. M. Council) includes representatives from the other M. clubs and resembles the M.C.C. of cricket. Foreign climbers also have their schools and the Gers. have given them a more arithmetical progression of difficulty up to the 'superior sixth.' Considerable use was made in the late war of M. experts for military training in mt. warfare (*q.v.*). See also ROCK CLIMBING.

See J. Tyndall, *Glaciers of the Alps*, 1860; L. Stephen, *The Playground of Europe*, 1871; E. Whymper, *Scrambles among the Alps in Years 1860 to 1869*, 1871, and *Great Andes of the Equator*, 1892; D. Freshfield, *Italian Alps*, 1873; *Exploration of the Caucasus*, 1902, and *Life of Saussure*, 1920; W. A. Coolidge, *Swiss Travel and Swiss Guide Books*, 1889; *The Alps in Nature and History*, 1908, and *Alpine Studies*, 1912; Sir M. Conway, *The Alps from End to End*, 1895, and *Mountain Memories*, 1920; A. F. Mummery, *My Climbs in the Alps and Caucasus*, 1895; G. Studer, *Über Eis und Schnee*, 1898-99; C. E. Mathews, *The Annals of Mont Blanc*, 1898; E. A. Fitzgerald, *New Zealand Alps*, 1896; O. G. Jones, *Rock Climbing in the English Lake District*, 1900; J. N. Collie, *Climbing in the Himalayas*, 1902; A. W. Moore, *The Alps in 1864*, 1902, 1939;

Sir C. Schuster, *Peaks and Pleasant Pastures*, 1911; *Men, Women, and Mountains*, 1931, and *Mountaineering*, 1948; A. Lunn, *The Alps*, 1914, *The Mountains of Youth*, 1925, and *Switzerland in Prose and Verse*, 1917; G. W. Young, *Mountain Craft*, 1920, and *On High Hills*, 1927; H. Raeburn, *Mountaineering Art*, 1920; G. Finch, *The Making of a Mountaineer*, 1921; E. F. Norton and others, *The Fight for Everest*, 1924; E. F. Bozman (ed.), *Mountain Essays*, 1928; F. S. Smythe, *The Kangchenjunga Adventure*, 1931, *Kanchen Conquered*, 1932, *In Alpine Journey*, 1934, *The Adventures of a Mountaineer*, 1940, and *Rocky Mountains*, 1948; G. D. Abraham, *Modern Mountaineering*, 1933; R. L. G. Irving, *The Romance of Mountaineering*, 1935, *The Mountain Way*, 1938, *The Alps*, 1939, and *Ten Great Mountains*, 1940; H. W. Tilman, *The Ascent of Nanda Devi*, 1937, and *Everest*, 1938, 1947; C. F. Meade, *Approach to the Hills*, 1940; T. A. H. Peacocke, *Mountaineering* (2nd ed.), 1943; E. Shipton, *Upon that Mountain*, 1943; T. Graham Brown, *Brenra*, 1944; Janet Adam Smith, *Mountain Holidays*, 1946; W. H. Murray, *Mountaineering in Scotland*, 1947; H. E. G. Tyndale, *Mountain Paths*, 1948, and trans. *Alpine Pilgrimage* (Kugy, 1934); *Nanga Parbat Adventure* (Bechtold, 1935); *Adventures of an Alpine Guide* (Chr. Klücker, 1940); and R. Clark, *The Early Alpine Guides*, 1949. See also the *Alpine Journal* and journals, and guides of the Scottish M. Climbers' and Fell and Rock Clubs.

Mountain-flour, see BERGMEHL.

Mountain Laurel (*Umbellularia californica*), Californian sassafras, or spice bush. It is a tall evergreen tree of the order Lauraceae, with alternate, lance-shaped leaves which give out a pungent camphor-like odour. It has greenish-yellow flowers clustered in umbels.

Mountain Limestone, compact bluish limestone of the Lower Carboniferous series which occurs in the mt. area of the Pennines. It is from 2000 to 4000 ft. thick, and is crowded with corals and encrusting.

Mountains. The mts. of the world occur in great systems forming chains or ranges of more or less parallel series, widening, narrowing, and forming nodes and radiations. There is sufficient appearance of scheme in these systems to lure geographers to formulate theories accounting for their arrangement. They border the edges of continents and appear to rise from deep oceans; the ranges are often continued out to sea and through the ocean as a series of ls. suggesting subdivision of part of the system, e.g. the Aluvian Is., the E. Indies, and Pacific Is. to New Zealand, which are again continued in the recently discovered ranges across Antarctica to connect with the Andes of S. America. The depths of the Pacific Ocean are thus bordered by a complete encircling mt. system. Again the Eurasian system from the Pyrenees across to the Panats follows the Mediterranean, Black Sea, and Persian Gulf coastlines. Such a scheme may be followed out in detail amongst all the mts. of the world, and it is impossible to exclude



FIG. 1

FOLDED MOUNTAINS

from any theory the conformation of the crust below the waters. The evidence of geological structure of the mts. goes far to explain the scheme, and it is considered that the great mt. systems are due to the shrinkage of the earth's surface consequent on cooling, a subsidence being accompanied by an elevation, parallel and more or less commensurate. Such a theory has led to somewhat of a mathematical investigation. A cooling body would shrink to smallest volume, and the smallest volume for a given surface is found in the tetrahedron (*q.v.*); the earth in cooling would, in fact, tend to the tetrahedral form, though other considerations such as its rotation would act against this. It is nevertheless true that if a volume of water, sufficient to cover five-sevenths of the surface, could be held by gravity in a tetrahedron, the arrangement would be quite similar to that on the earth, the edges forming mt. systems and continents, the faces the ocean. This theory was promulgated by Lothian Green. It would seem, however, to imply, though not necessarily, two consequences: the permanence of the great mt. ridges and that of the deep oceans. It cannot be said that either is estab.; there is a good deal of evidence for the former but considerable evidence against the latter. The present great mt. systems were uplifted in Tertiary times, at any rate to their present altitude, but this may have been only an additional thrust. On the other hand the mts. of Scandinavia, W. Scotland, and Ireland, and also the Appalachian system, are much older and were probably once much higher. As regards the formation of mts., it is possible to classify in part. The surface of the earth is subject everywhere to denudation (*q.v.*), and the elevated regions specially so. Yet there are mts. which owe their existence to the denudation alone of elevated folds in the earth's crust. Such folded mts. are illustrated in Fig. 1. The diagram also shows clearly the relation of foot-hills to their axial range. Fig. 2 shows a more complicated system, illustrating clearly the enormous contortion force, the steep angles of mt. strata, which often give rise to fantastic scenery and the impression of catastrophic forces. A special type of denudation mt. is often classed as 'relict' or 'residual' mt. (Fig. 3). In this case denudation has been prolonged, and it is quite common to find the synclines forming the ridges. There are, however, many types of relict

mts. Mts. are often the result of faulting and consequent slipping of strata; they may be classed as 'block' mts. Figs. 4 and 5 illustrate their formation. The former shows a rift valley edged by mountainous sides, which may weather into peaks, etc.; the latter, a raised block due to bilateral subsidence. When dissected by weather and streams an irregular mt. mass results; if the block is tilted a range of mts. results. An intrusion of volcanic rock may have the effect of elevating the strata into a dome-like shape, which gives rise on denudation to a group of mts.; to these the name 'domed' mt. has been applied. In all cases separate mts. owe their form to denudation. The central 'core' when highly inclined gives rise to the peaks, aiguilles, and horns. The Rockies, Andes, Pyrenees, Alps, Himalayas, and the other portions of the great connected systems of the world are young folded mts.; the Scandinavian mts., Scottish mts., Urals, Australian mts., are examples of old, residual, or relict folded mts.; the Vosges and Black Forest mts., the mts. enclosing Bohemia, and many of those in Central Africa, are block mts. Mts. have largely served to isolate or separate communities and thus determined nationality and race. The Lat. and Teutonic races have in this way been largely separated, while Switzerland and Afghanistan owe their independence mainly to the nature of their countries, and similarly, until recent times, Abyssinia; the Andes of S. America are a marked example of political div. Great range of climate is shown in elevated ranges, which gives a characteristic zonal distribution of vegetation arranged according to elevation, and, as in Uganda, Brazil, Peru, and Mexico, renders possible an energetic and progressive pop. in hats where lowlands are energetively. On the other hand, in Tibet, the climate forbids progress. In Norway and Nct. Ptenicia, Greece, Spain, and Portugal mts. have largely enforced maritime enterprise. They, further, are a great factor in local climate, as in the Mediterranean, the Ganges valley, and New Zealand. Egypt



FIG. 3. RELICT OR RESIDUAL MOUNTAIN

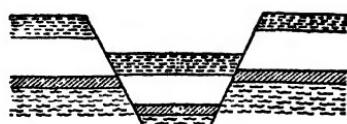


FIG. 4

BLOCK MOUNTAINS

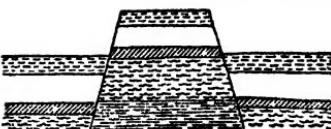


FIG. 5

is a remarkable case of an estab. civilisation dependent on mts., for the Nile is fed so well from Abyssinian and Central African groups that it can traverse the desert; the Indus is a similar riv. The Fohn, Chinook, and N.-Westerns of New Zealand (q.v.) are examples of beneficial winds due in part to mts. The form of dissection of mt. masses is often of great importance, particularly in the matter of transverse valleys, cols, saddles, and necks. Many instances occur in the Alps of Switzerland. In England the gaps in between mts., e.g. the Cheshire plain, saddles such as Shap Fell, and the transverse valley of the Aire, have had great influence on communication, both military and commercial (see *RIVERS*; *VALLEYS*). The great mt. systems are, further, the regions of most frequent earthquakes (see *EARTHQUAKES*). They are also often associated with the distribution of volcanoes. Where breaks in the continuity of the strata of mts. are, geologically, recent, and elevation, subsidence, and faulting are not quiescent or complete, earthquakes are likely to be experienced, and, if in regions near deep water, e.g. Mediterranean and Pacific, the intrusion of the water along faults and cracks gives rise to volcanic activity (see *VOLCANOES*). As it is largely in mountainous regions where the lower strata are exposed or near the surface, they become the centres of the mining of valuable, because somewhat rare, metals, e.g. the Rockies and Andes, the Australian and New Zealand Alps. See also *RIVERS*, *VALLEYS*, *GLACIERS*, etc., and *GEOLGY* and its bibliography. See M. Reade, *Origin of Mountain Ranges*, 1886; O. Fisher, *Physics of the Earth's Crust*, 1889; Lord Avebury, *Scenery of Switzerland*, 1890; J. Geikie, *Earth Sculpture*, 1898; J. E. Murr, *Scientific Study of Scenery*, 1900; Sir A. Geikie, *Scenery of Scotland* (3rd ed.), 1901; E. Suess, *The Face of the Earth*, 1906; J. W. Gregory, *The Making of the Earth*, 1912; J. H. Fabre, *This Earth of Ours* (trans.), 1923; L. W. Collett, *The Structure of the Alps*, 1936; C. A. Cotton, *Volcanoes as Landscape Forms*, 1944; and A. Holmes, *Principles of Physical Geology*, 1944.

Mountain Sheep. See *SHEEP*.

Mountain, The (Fr. *la Montagne*), name given to the extreme revolutionary party, led by Danton and Robespierre. In the legislatures of the first Fr. Revolution.

Mountain Warfare. This type of warfare differs mainly from 'open warfare' in the fact that physical features, in the form of mts., deep valleys, swift streams,

and absence of good roads, necessitate considerable modification of the usual tactics. The nature of the country generally favours hill tribesmen, at least at the outset, until their habits of fighting become more generally known and the attackers get accustomed to moving in the mountainous country with a certain amount of ease. Transport, until modern times, was usually limited to pack animals, artillery also being carried by this method, but airborne reinforcements and supplies, as, for example in the Burmese campaigns of the Second World War, have resolved the problems of logistics in notable degree. Pack animals themselves (principally mules) were still used in forward areas in int. campaigns 1939-1945, often being transported to the scene of action by air or motorised transport. The advent of aircraft has materially assisted reconnaissance, especially by means of aerial photography. In the foot-hills tanks and armoured cars find scope for operations. The passage of a detle through hostile mountainous country is a difficult and dangerous process. The advance guard goes forward and places pickets on the heights overlooking the entrance, and clears the country of all enemy within range. This done, other pickets pass beyond them, and perform the same duties, thus ensuring the safety of the entire route. Meanwhile the main body proceeds along the route as security is assured. As the tail of the main body passes a line of pickets, the latter close in on the route and form a rearguard. In barren hilly country digging of trenches is usually impossible, so that protection is obtained by building low walls of stones (called 'sangars'). The classic work on M. W. is P. J. de Bourret's *Principes de la guerre de Montagnes* (1775), 1888, see also B. H. Liddell Hart. *The Ghost of Napoleon*, 1933. The strategic problems of M. W. are well illustrated in the campaign of Wellington in the Pyrenees in 1813. The possession of good lateral communications in the foot-hills or plains is essential. Troops placed far up the mt. defiles are liable to be isolated, and accordingly the best defensive system is to hold forward positions lightly and to concentrate upon the enemy as his columns debouch from the mts. The strength of a mt. system as a defensive line is popularly exaggerated. Its greatest use is after the enemy has left the mts. behind, thus limiting his lines of communication to a few narrow valleys, very vulnerable to air bombing.

Training in the Second World War.—Early in 1940 a battalion of volunteers incorporated in the Scots Guards was sent to Chamonix to be trained in M. W. On the disbandment of this unit a fresh start was made in Iceland, in 1941, where a number of expert mountaineers and explorers taught officers and other ranks to live in the snow, to ski with heavy loads, and general mt. craft. The training cadre returned to Great Britain early in 1942 and training was continued in Scotland, in the Cairngorm Mts., where selected personnel from the 52nd (Lowland) Div. were given courses in M. W.; winter training was severely limited by lack of snow. More ambitious plans were put into effect in 1943, with the object of training mountaineer battalions to operate under all conditions on high mts. The Lovat Scouts, one of the units selected, were given a three-month course in intensive rock climbing in N. Wales and then sent to the Canadian Rockies, under Brit. and Canadian instructors, to complete their training under severe winter conditions. They learnt to face all types of weather, reaching a high standard and making a number of first winter climbs, including Mt. Columbia. Later when the unit was sent to Italy, training of reinforcements was carried out in the Abruzzi Apennines. Similar training of mountaineer battalions was conducted in Syria.

See also ITALY, FIRST WORLD WAR, and GREECE, SECOND WORLD WAR, CAMPAIGN IN; BURMA, SECOND WORLD WAR, CAMPAIGNS IN.

Mountain Wine, sweet, luscious variety of the white Sp. wine of Malaga, made from white grapes picked when quite ripe.

Mount Athos, see ATHOS.

Mount Barker: 1. Tn. of Hindmarsh co., S. Australia, 18 m. S.E. of Adelaide, at the foot of Mt. Barker. Much fruit is grown, and there are tanneries. Pop. 2800. 2. Postal centre of Plantagenet co., W. Australia, 30 m. from Albany. Pop. 2000.

Mountbatten of Burma, Rear Admiral Louis (Francis Albert Victor Nicholas), first Viscount (b. 1900), younger son of Admiral of the Fleet the first marquess of Milford Haven and Princess Victoria, daughter of Louis IV., grand duke of Hesse, was known as Prince Louis Francis of Battenberg until, in 1917, his father relinquished the title and took the surname of M. Educated at Osborne, Dartmouth College, and Christ's College, Cambridge, he entered the R.N. as a naval cadet, 1913. He became midshipman 1916, Lieutenant 1920, Lieutenant-commander 1928, commander 1932, captain 1937, commodore 1941, rear-admiral 1946. He served in H.M.S. *Lion* 1916, in H.M.S. *Elizabeth* 1917, in H.M.S. *Repulse* 1921, H.M.S. *Renown* 1921, H.M.S. *Revenge* 1923. He was senior wireless instructor, Signal School, Portsmouth, 1929-31; fleet wireless officer, Mediterranean fleet, 1931-33; in command of H.M.S. *Daring*, 1934, and of H.M.S. *Wishart*, 1935; in Admiralty (Naval Air Div.), 1936. He commanded H.M.S. *Kelly* and the 5th Destroyer Flotilla, 1939, and H.M.S.

Illustrous, 1941. He was chief of combined operations, 1942-43; honorary lieutenant-general, 1942. Appointed supreme allied commander, S.E. Asia in 1943, he was still in command at the victorious conclusion of the war in Burma. For details of the military operations under his command *see under BURMA, SECOND WORLD WAR CAMPAIGNS IN*. In 1946 he was appointed to command the first cruiser squadron, reverting from acting rank of admiral to his substantive rank of rear-admiral. His substantive naval rank in 1941 when he left the *Illustrous* to succeed Adm. Sir Roger Keyes (q.v.) in charge of combined operations headquarters was that of captain. As chief of combined operations he reached acting rank of vice-admiral and held at the same time acting rank of lieutenant-general and air marshal. On becoming supreme allied commander S.E. Asia Command he was advanced to acting admiral, but on relinquishing that command he reverted to his proper naval rank which by then was rear-admiral. He succeeded Lord Wavell as governor-general of India, 1947. He took a prominent part in the procedural plan for the transfer of power to India on a dominion status basis in Aug. 1947 in anticipation of the earlier offer by which the transfer would have taken place in 1948. On the Indians agreeing among themselves to partition the country into the two states of India and Pakistan, M., by the choice of the Indian Congress, became governor-general of the new dominion of India, and held office until June 1948. *See R. Murphy, The Last Viceroy, The Life and Times of His Excellency Rear-Admiral the Earl Mountbatten of Burma, 1948.*

Mountbatten, Lieutenant Philip, *see under EDINBURGH, DUCEDOM OF*.

Mount Carmel (Palestine), *see CARMEL, MOUNT, CARMELITES, ORDER OF*.

Mount Carmel: 1. Co. seat of Wabash co., Illinois, U.S.A., on the Wabash R., 24 m. S.S.W. of Vincennes. There are mills, railroad shops, and manuf. of bricks. Pop. 7000. 2. Bor. of Northumberland co., Pennsylvania, U.S.A., 6 m. from Shamokin. Coal is mined, and mining machinery and miners' supplies are manufactured. Pop. 17,800.

Mount Clemens, health resort, co. seat of Macomb co., Michigan, U.S.A., on Clinton R., 20 m. N.N.E. of Detroit. There are noted mineral springs. Beetsugar, lumber, and wagons are manufactured. Pop. 14,400.

Mount Desert, is. of Hancock co., Maine, U.S.A., in the Atlantic, W. of Frenchman's Bay. The surface is mountainous; highest peak, Green Mt. (1762 ft.). There are numerous lakes and mts. tarns. Bar Harbor is a favourite summer resort. Fishing and shipbuilding are carried on. Pop.: Bar Harbor 5000; M. D. (tn.) 2200.

Mount Eden, bor. and a suburb of the city of Auckland, New Zealand, dominated by M. E. (Maori name *Maungawhau*), a volcanic cone with a large crater from which a fine view can be obtained of the city and harbour of the ocean on both

coasts. The bor., which is a separate municipal entity from Auckland, is primarily a residential suburb of Auckland, but has a number of important industries: ammunition, timber, wall-board, and furniture factories, etc. Pop. 22,000.

Mountevans, Baron, see EVANS, SIR EDWARD RADCLIFFE GARTH RUSSELL.

Mount Gambier, tn. of S. Australia, near the Victorian border. It is the centre of a grape-growing dist. Pop. 8000, with a further 4000 living in the nearby area.

Mountmellick, mrkt. tn. of Queen's co., Eire, 6 m. N.W. of Maryborough. Pop. 2500.

Mount Palomar Observatory, in California, U.S.A., houses the largest astronomical telescope in the world, at an altitude of 5600 ft. The telescope is of the reflector type; its mirror, made of glass with a film of aluminium, has a diameter of 200 in. and weighs 14½ tons. It will collect about half a million times as much light from a celestial object as does the human eye, and reveal stars 1,000,000,000 light-years away. It will thus give a new impetus to the study of cosmography and astrophysics of phenomena outside our stellar system.

Mount Pleasant, bor. of Westmoreland co., Pennsylvania, U.S.A., 32 m. S.E. of Pittsburgh, in a rich agric. dist. Coal is mined, and manufcts. include lumber and flour. Pop. 5900.

Mountsorrel, tn. of Leicestershire, England, on the Soar, 7 m. from Leicester. The chief industry of M. is the mining of granite from the extensive quarries. Pop. 3000.

Mount Stephen, George Stephen, Baron (1829-1921), Canadian financier, b. at Dufftown, Banffshire, Scotland. He emigrated to Canada in 1850, and went into business in Montreal, where his abilities soon secured him an excellent position and he became director and president of the Bank of Montreal. In partnership with his cousin, Donald Smith (later Lord Strathcona), he purchased the St. Paul and Pacific Railway, and they then started the construction of the Canadian Pacific Railway, which was completed in 1885. The following year he was made a baronet, and raised to the peerage in 1891, taking his title from a peak in the Rocky Mts., named after him while the railway was in course of construction. He left Canada in 1888, and lived in Scotland and England, chiefly at Brocket Hall, Hertfordshire. A great philanthropist, he gave generously to hospitals in London, Montreal, and Aberdeen, distributing, in his lifetime, more than £1,000,000 and leaving the residue of his estate to the King Edward Hospital Fund. A portrait of M. S., painted by Sir George Reid in 1894, is in the C.P.R. offices, Toronto. See K. Morris, *The Story of Lord Mount Stephen*, 1922.

Mount Vernon: 1. City of Westchester co., New York, U.S.A., on the Bronx R., 18 m. N.N.E. of New York. Pop. 67,400. 2. Co. seat of Jefferson co., Illinois, U.S.A., 74 m. E.S.E. of St. Louis (Missouri). Pop. 14,800. 3. Tn. of Fairfax co., Virginia.

U.S.A., on the Potomac R., 15 m. S. of Washington. Washington's mansion was purchased for the nation in 1859. Pop. M. V. dist. 6000. 4. Co. seat of Knox co., Ohio, U.S.A., on the Vernon R. and Owl Creek, 40 m. N.E. of Columbus. Pop. 10,200. 5. Co. seat of Posey co., Indiana, U.S.A., on the R. Ohio, situated 13 m. from the S.W. corner of the state. Pop. 5700.

Mount Wilson Observatory, near Pasadena, California, U.S.A. The reflector of its telescope, 100 in. in diameter, was the largest in the world until the mounting of the 200-in. reflector of the Mt. Palomar telescope, also in California (designed to photograph objects 1,000,000,000 light-years distant, or twice as far as the M.W. telescope). The pre-eminent part played in recent years by the M. W. O. has tended to overshadow astronomers and observatories doing essential but less spectacular work. While the observations have been so largely made at M. W. O., the theorising has been done more in Europe, particularly in Britain. Among the discoveries of astronomers of M. W. are those of dwarf stars and of the movement of distant universes away from our galaxy. Other astronomers had found in the heavens dwarf stars no larger than the earth yet glowing with white heat of a stellar maturity. The smallest of them was discovered by Dr. G. P. Kuiper at the M. W. O. He found that this star was only 4000 m. in diameter and so dense that 1 cu. in. of its material would weigh 630 tons on the earth. In 1925, by means of spectroscopic studies of more than forty distant universes, V. M. Slipher of the Lowell Observatory found that these were moving rapidly away from the galaxy. This led E. P. Hubble and M. L. Humason of the M. W. O. to make an exhaustive study of island universes and, using the finest instruments, they discovered that not only do the distant nebulae move away from our own system, but the speed of recession is in direct proportion to the distance of the nebulae from us. With the publication of the general theory of relativity by Einstein, it was predicted that the lines in the spectrum of a star would be displaced by an amount depending upon the mass of the star. Some years later the discovery was made that the companion to Sirius must have a mass altogether out of proportion to its luminosity. This provided a fortuitous opportunity of testing the prediction, inasmuch as the effect in the spectrum of the star would be much greater than in the sun or in an ordinary star. The observation could be made only with the 100-in. reflector at M. W. O., but it was successfully accomplished by Pease. It was one of the greatest feats of modern observation to realise the method, proposed by Michelson, of measuring the diameters of stars with the 20-ft. interferometer made for the purpose at M. W. O. by Pease and mounted on the 100-in. reflector.

Mourne Mountains, range in the S. of Down co., Ulster, N. Ireland, extending 11 m. from S.W. to N.E. between

Newcastle on the Irish Sea and Carlingford Bay. Slieve Donard is the highest peak (2798 ft.).

Mouseron (Flemish *Moeskroen*), tn. of W. Flanders, Belgium, 7 m. S.S.W. of Courtrai, near the Fr. border. Manufs. include woollens, cottons, tobacco, and soap. It was at the hamlet of Risquons-Tout that in 1848 the Belgian Army had to repulse the Fr. revolutionists, who tried to enter the young kingdom by force. Pop. 36,000.

Mouse, name popularly applied to a great number of small rodents of various genera, but correctly only to the smaller species of the genera *Mus*, *Microtus*, and *Apodemus*. The three Brit. species are the house M. (*Mus musculus*), the harvest M. (*Microtus minutus*), and the long-tailed field M. (*Mus spretus*). The M., whatever its origin, is now common in every continent, and takes serious toll of man's food stores and causes no little damage to his architecture. The fur varies greatly in tint and markings when the animals are bred in captivity. The whistling bird-like song of certain mice at dusk is an estab. fact. The harvest M. is unique among Brit. mammals in having a prehensile tail. Its spherical breeding nest, built on cornstalks used as scaffolding, is an exquisite structure. The long-tailed field M. is a handsome, bold creature, and does much damage to farm and garden crops, hunting for food at night. It is one of the most prolific of mammals. For the short-tailed field M., which is not really a M., see *Vole*.

Mouse-deer, see *CHEVROTAIN*.

Mouse River, Canadian riv. (500 m. long), rising in Saskatchewan, flowing S. into N. Dakota, then E., turning sharply N., recrossing the frontier, and finally joining the Assiniboin near Brandon.

Mousquetaires, Fr. word meaning soldiers armed with a musket. Such soldiers were at first included in companies of pikemen in the proportion of one to three, whilst the muskets used were so heavy that valets were employed to carry them, until abolished by Charles IX. In 1600 22 M. were called carabiniers, but resumed their old name under Louis XIII. After the king's M. had been suppressed, from 1646 to 1657, Mazarin presented his personal guard to Louis XIV. in 1660, and there were thus from 1664 two separate forces known as 'white' and 'black' M. Under Louis XIV. these companies formed in large measure a school for youthful nobles. M. were suppressed in 1775, reorganized in 1789, disbanded in 1792, reappeared in 1814, and finally abolished in 1815.

Mousterian, name given to the closing period of the lower Paleolithic age in Europe and derived from the cave of Le Moustier in Dordogne. Here were found flint implements as well as bones of the mammoth, woolly-haired rhinoceros (*Rhinoceros merckii*), musk-ox, and cave-bear. These discoveries show that when the last or Würm glaciation set in, W. Europe was peopled by men of the Neanderthal type—M. culture has also been

found along the African shores of the Mediterranean. The M. culture is regarded by Sir Arthur Keith as beginning about 40,000 years ago and coming to an end about 20,000 years later. The last great ice age is presumed by geologists to have affected Europe for a period of about 25,000 years; but Arctic conditions did not reach a climax and then gradually yield to our milder climate. There was a long inter-glacial interval when cold conditions prevailed, but of a kind which permitted Europeans to camp in the open. It was in this interval that the Cromagnon man appeared in Europe, bringing with him the Aurignacian culture and it was then, or before then, that the Neanderthal type disappeared from Europe together with the M. culture. See also *DORDOGNE*. See H. J. Sollas, *Ancient Hunters*, 1915; H. F. Osborn, *Men of the Old Stone Age*, 1918; M. C. Burkett, *Prehistory*, 1921; R. A. S. Macalister, *A Textbook of European Archaeology*, 1921; J. L. Myres, in *Cambridge Ancient History*, vol. I, chap. I, sec. 1, 1924, with list of references, pp. 620-21; Sir Arthur Keith, *Antiquity of Man* (2nd ed.), 1925, and *New Discoveries relating to the Antiquity of Man*, 1931.

Mouth, entrance to any cavity or canal; in particular, the entrance to the alimentary canal between the lips, including the cavity in which mastication takes place. The lips are folds of flesh composed of skin, areolar tissue, or superficial fascia, the orbicularis ovis muscle, submucous tissue, and mucous membrane. The cheeks are similar in structure, except that they are actuated by the buccinator muscle, which compresses the cheek and retracts the angle of the lips. The opening of the duct from the parotid gland is situated on the M. side of the cheek opposite the second upper molar tooth, while other salivary ducts are situated on the same surface. The gums are composed of mucous membrane superposed upon fibrous tissue connecting with the periosteum of the jaw-bone. The teeth are fixed in the gum and jaw-bone, and the mucous membrane of the gum rises up round each tooth. The root of the M. is formed by the hard and soft palate. The hard palate consists of mucous membrane and fibrous tissue connecting with the superior maxillary and palatal bones; the soft palate is composed of an aggregation of muscles. Diseases of the M. include caries and other affections of the teeth; stomatitis, or inflammation of the M., characterised by swelling, salivation, pain, and ulceration; salivary calculus, or stony concretions in the salivary ducts; and mumps, a highly infectious disease of the parotid gland, characterised by swelling and difficulty in swallowing.

Mouvement Républicain Populaire, see *FRANCE, History*.

Mowing Machines are of two main kinds, viz. those used for cutting ornamental lawns, where the object is to give the grass a neat appearance, and those used in agriculture, where the object is to gather the hay or fodder crop. The former, commonly called lawn mowers, vary in size from those for small lawns

that can be pushed by a child to large machines driven by a motor. Cutting is performed by steel blades arranged spirally on a cylinder which revolves near the ground. The agric. implement has a long cutting-bar in which a series of knives works scissors-fashion from gearing attached to the carriage wheels. *See also REAPING.*

Mowla, *see MOLLAIR.*

Moyen-Congo, *see MIDDLE CONGO.*

Moeyuvre-Grande, tn. of the dept. of Moselle (Lorraine), France, in the arron. of Thionville, on the R. Orne, 104 m. from Metz. Iron-ore is mined, and there are smelting works. Pop. 10,200.

Moyn, Charles Le, *see LE MOYNE.*

Moynihan, Berkeley George, first Baron (1865-1938), Brit. surgeon; Hunterian prof. at Royal College of Surgeons, 1924; president from 1927. He was an expert in treatment of abdominal complaints, on which he wrote several treatises. He served with R.A.M.C. in the First World War, becoming major-general. M. founded the *Journal of Surgeons*; his pubs. include *Abdominal Operations* (4th ed. 1925).

Moyobamba, cap. of San Martin dept., Peru, S. America, 140 m. from Jaen, on a trib. of the Huallaga. Panama hats are manufactured. Pop. 14,500.

Mozambique, or Macâmbique: 1. Portuguese colony in E. Africa, lying between 11° and 27° S. lat., bounded on the N. by the Rovuma R., S. by Natal, E. by the Indian Ocean, and W. by Lake Nyusa, S. Rhodesia, Nyusaland, Transvaal, and Swaziland. The prin. rive. are the Rovuma, Pungwe, Sabi, and Limpopo. The flora is rich, there being forests of precious woods and coco-nut palms, orange, lemon, pepper, banana, cashew, coffee, cotton, and tobacco. The fauna includes all the wild and domestic species of the African continent, elephants being plentiful. There are coal deposits in the Tete Region, and some gold on the Upper Zambez. Exports: sugar, cotton, coal, mango bark, fruits, wax, ivory, timber, maize, aloes, tobacco, ground-nuts, and palm oil, valued in 1937 at £3,330,000. Imports: fermented flour, rice, cloth, alcoholic liquors, agric. and industrial implements, fuel oils, valued at nearly £4,000,000. There are some 1200 m. of railways and 19,000 m. of roads. There is an agreement between M. and S. Africa regarding the ann. recruiting of M. labourers for employment in the Witwaterstrand mines. Chief tns. are Lourenço Marques (cap.), Bela, M., Inhambane, Quelimane, Antonio Enes, Porto Amelin, Chinde, Pebane, Moma, Vila João Belo, Tete, Ibo, and Macuse. The Companhia de Moçambique was wound up in 1912, on the expiration of its charter. Area 297,731 sq. m. Pop. 5,085,630. 2. Once the chief tn. of M., situated on a coral is. It has considerable shipping trade. Pop. 8000. 3. Channel between the E. coast of Africa and Madagascar. Length (about) 1000 m., breadth from 280 to 600 m. At the N. entrance lie the Conoro Is. *See also PORTUGUESE EAST AFRICA.* *See R. N. Lyne, Mozambique: its Agricultural De-*

velopment, 1813, and I. Martins, Portugal in Africa, 1891.

Mozarabes, Christians who lived under Moorish rule in Spain, being allowed at the same time to retain their religion. They conformed almost entirely to the customs of their conquerors, even to the extent of using Arabic characters in the writing of Sp. They were well treated, and continued to retain the Mozarabic liturgy, which is still used in a chapel of Toledo cathedral, and at Salamanca.

Mozart, Wolfgang Amadeus Chrysostom (1756-91), Austrian composer, b. at Salzburg, son of Leopold M., a professional musician. At the age of six he made his débüt in Vienna as a prodigy violinist and pianist. His remarkable memory enabled him as a boy to perform a feat which caused a sensation; he went to



WOLFGANG MOZART

the Sistine Chapel, listened carefully to a misericordie sung only twice yearly, and at home wrote it out from memory. At the age of seven he had pub. his first sonatas, and at the age of twelve, besides having the reputation of being able to play at sight any composition for organ, clavier, or violin, he had written an opera, a symphony, and a large number of smaller works. By the time he was twenty-five he was well known in Vienna, Munich, London, Paris, and Milan as one of the world's greatest composers; everywhere he met with excellent receptions, not only by reason of his wonderful playing and brilliant genius as a composer, but also on account of his great personal charm and vivacious disposition. Leaving home finally in 1781, he took up his abode in Vienna, where, in 1782, he married Constanze Weber, whose sister, Aloysia, had not long previously refused him. The marriage, though happy enough on purely mutual grounds, was hardly a success in other respects. M. was none too wealthy, generous to a fault, and devoid of business capacity, and the ten years or so which yet remained to him were consequently

passed in a hard struggle against poverty and debt. As a composer M. is remarkable as the possessor of a gift of extraordinary fluency; as a melodist he showed the same limpid beauty as his friend Haydn; in the richness of his harmony and colouring he anticipated Beethoven, and he was as skilled in counterpoint as Handel, if not as Bach himself. His orchestral music is an advance on anything previously written, and many of his symphonies, especially the last three, in E flat, in G minor, and in C, the *Jupiter* (all 1788), and some of his piano and violin concertos, are favourites with modern audiences. His operas are perhaps his most characteristic works, showing as they do his superb technical mastery and inventive skill in the most felicitous combination, although his libretti are often preposterously bad. In musical delineation of character he is unsurpassed, and he is the first truly great master of the concerted number (trio, quartet, etc.), in which conflicting emotions are expressed simultaneously, an achievement rendered possible only by polyphony. His last work was his unfinished *Requiem*. His chief operas were *Bastien und Bastienne* (1768); *La Finta Giardiniera* and *Il Re Pastore* (1775); *Idomeneo* (1781); *Die Entführung aus dem Serail* (1782); *Le Nozze di Figaro* (1786); *Don Giovanni* (1787); *Cosi fan Tutti* (1790); and *Die Zauberflöte* (1791). M. also wrote much church music, a large number of instrumental sonatas and vocal works, both solo and concerted, and a quantity of chamber music, his total compositions being carefully catalogued by Kochel and numbered 626 items. See lives by O. Jahn (Eng. trans.), 1882, and E. J. Breakespear, 1902. See also E. Dent, *Mozart's Operas*, 1913; F. Kerst, *Mozart in his Own Words*, 1926; E. Blom, *Mozart (Master Musicians)*, 1935; A. Einstein, *Mozart: His Character, His Work* (trans. by A. Mendel and N. Broder), 1947; and E. Moerike, *Mozart on the Way to Prague* (trans. by W. and C. Alison Phillips, 1947). M.'s characteristic and spontaneous Letters, ed. by H. Mermann, were trans. into Eng., 1928.

Mozdok, tn. in the N. Caucasian area of the R.S.F.S.R., 50 m. N. of Vladikavkaz, on the Terck. It trades chiefly in fruit, wine, and silk. M. marked the limit of the Ger. advance into the Caucasus in 1941 and it was the scene of most bitter fighting for sev. weeks. Its loss would have placed the famous Grozny oilfields at the mercy of the enemy; but the turn of the tide came at the end of the year. See further under EASTERN FRONT or RUSSO-GERMAN CAMPAIGNS IN SECOND WORLD WAR.

Matslavi, tn. in the Mogilev Region of the Byelorussian S.S.R., 60 m. N.E. of Mohilev, with trade in hemp.

Mizensk, or **Mzensk**, tn. in the Kursk Region of the R.S.F.S.R., on the navigable Zusha R., 30 m. N.E. of Orel. There is trade in cereals, hemp, oil, etc. Candies, soap, tallow, and lace are manufactured. The cathedral contains a miraculous image of St. Nicholas, and there is a

spring near by which is reputed to cure diseases.

Mtskheta, or **Mtskhet**, vil. of the Georgian S.S.R., anct. cap. of Georgia, at the confluence of the Aragva and the Kura. It contains a fine cathedral, and the tombs of many Georgian rulers. Pilgrims from the Caucasus still visit M. Pop. 800.

Much Wenlock, Shropshire, England, see **WENLOCK**.

Much Woolton, see **WOOLTON**.

Mucilage, aqueous solution of a gum: some gums form a clear solution in water, while others swell up to form a sticky viscous liquid, more properly called M. *Mucilago Tragacanth* is prepared from the gum which exudes from the stem of *Astragalus gummifer*. Cherry-tree gum also forms a thick M. Gum kuteera and gum of Bussorah are often imported as adulterants of gum tragacanth; their properties are somewhat similar to those of gum tragacanth. *Mucilago acacia* is formed by adding 34 parts of acacia to water to make 100 parts; it is used as a substitute for *M. Tragacanthæ*. *M. Amyli*, or starch M., is used for making enemas. A M. formed from the pit of sassafras is used as a soothing application for inflamed eyes, and also as a demulcent drink for inflammation of the mucous membranes and of the kidneys. *M. Ulei* is formed from elm gum; other Ms. are produced by infusing seeds, roots, etc., in boiling water.

Mucin, viscid substance, capable of being split up into a protein, and a carbohydrate found in the human body in the bile, urine, feces, saliva (in which it acts as a lubricant), and gastric juice, but most abundantly in intercellular substance. See also **GUM**.

Mucis, see **MOSSES**.

Muckers, name given to a sect which arose at Königsberg, Germany, in 1835, its chief leaders being J. W. Ebel and G. H. Diestel. The opinions of the sect were so expressed as to cause an uproar directed against their sensuality. For a defence see J. I. Mombert, *Faith Victorious*, 1882.

Mucoid, substance resembling mucus in many ways, but differing from it in some chemical reactions. M. is not precipitated from solution by acetic acid. Sometimes it precipitates slightly, but is then soluble in excess of acid. It is thus distinguishable from mucus.

Mucous Membrane, see **EPITHELIUM**.

Mud, term employed for the impalpable argillaceous matter which settles in quiet waters. When consolidated and devoid of lamination it is known as mudstone. The dark blue Ms. of the sea bottom derive their colour from decomposing organic matter and sulphide of iron, while the green Ms. are so coloured from the glauconite grains which they contain. Near coral reefs the sea floor is covered with white M. due to the abrasion of coral, while round volcanic ls. a grey M. formed from degraded volcanic rocks is found.

Mudar, name given in parts of India to an evergreen asclepiadaceous plant, *Calo-*

tropis gigantea. It has large wedge-shaped leaves and fine purple flowers clustered in umbels. There is a smaller Persian species (*C. procera*) with white flowers. The M. yields an acrid milky juice, found useful in India for elephantiasis, intestinal worms, and skin diseases.

Mud Devil, see MENOPOME.

Mudfish, or Bowfin (*Amia calva*), fish occurring in the N. Amer. lakes and rivs. which has the air-bladder highly developed as a lung sac so that it can live out of water for a long time. It is about 30 in. long, and a dark mottled green.



E.N. 4.

ALGERIA: MUZZIN CALLING THE FAITHFUL TO PRAYER

It feeds voraciously upon crustaceans and insects, and its flesh is soft and ill-flavoured.

Mudie, Charles Edward (1818-90), founder of M.'s Library in London, b. at Chelsea. In 1842 he opened a circulating library in Southampton Row. Ten years later he moved into the premises in New Oxford Street (later removed to Kingsway). At the peak of its prosperity the company had 40,000 subscribers (1888), but it gradually declined in competition with other concerns and was closed down in July 1937. M. was deeply religious and a great philanthropist. He pub. *Stray Leaves*, a collection of hymns, in 1872.

Mudki, small tn. of the W. Punjab, Pakistan, 70 m. S.E. of Lahore, on the Ravi. Here the first battle in the Sikh war was fought (1845), when the Brit. under Sir Hugh Gough, repulsed the Sikhs. Pop. 3000.

Mudros, tn. on the S. coast of Lemnos, in the Gk. Archipelago. It was a Brit. base of operations against the Turks in the Gallipoli campaign, 1915. The armistice

between Turkey and the Allies was signed here in 1918.

Mud Volcanoes are of two kinds: (1) where the source of movement is the escape of gases; (2) where the active agent is steam. The former are conical hills formed by the accumulation of fine saline mud which is given out with various gases (marsh-gas, carbon dioxide, etc.) from an orifice or crater in the centre. The latter occur in volcanic regions, and are due to the escape of water and steam through beds of friable rock.

Muezzin, or Muaddin, Muslim official whose duty it is to announce the hours of prayer to the faithful. This he does from the minaret or side of the mosque in a nasal chant. His call is as follows: 'Allah is great (three times). I testify that there is no God but Allah (twice). I testify that Mohammed is the apostle of Allah (twice). Come to prayer (twice). Come to the best of works (twice). There is no God but Allah.'

Muffle, arched vessel, used in metallurgy, which is constructed to be placed over cupels and tests in the operation of assaying. It preserves them from contact with ashes, smoke, etc., but does not hinder the action of the fire on the metal nor prevent inspection. For the M. furnace for firing porcelain, etc. see FURNACES.

Mufti (Arabic, expounder of the law). The Turkish Grand M. was the supreme head of the Ulemas (servants of religion and laws), and with the grand vizir had the supreme guidance of the state. The Turkish laws being based on the Koran, the M. was head of the judges, the chief spiritual authority, and therefore sometimes known as Sheikh-al-Islam (Lord of the Faith). The office was abolished by the Turkish Republic in 1924. At an election of the president and members of the Supreme Moslem Council in Jerusalem in 1922 Haj Amin E. Husseini, an ex-officer of the Turkish Army, was chosen president and combined that office with the office of M. of Jerusalem. Bitterly anti-Brit. on account of the Balfour Declaration (q.v.), he headed the revolt of the Higher Arab Committee in 1936, and when the revolt was ended fled the country, and after the Second World War broke out eventually found his way to Iraq and thence to Italy.

Muggletonians, Eng. sect originating in 1651, and founded by John Reeve and Ludovic Muggleton (1607-97), both of whom claimed the possession of the spirit of prophecy. Muggleton, who was a journeyman tailor, professed to be the 'mouth' of Reeve as Aaron was of Moses. They further claimed to be the two witnesses of Rev. xi. and to be empowered to curse their opponents. An exposition of their very unorthodox doctrines was pub. in 1656 under the title of *The Divine Looking-Glass*. Wm. Penn's book, *The New Witnesses proved Old Heretics* (1672), was greeted again by the M., and in 1676 Muggleton was tried at the Old Bailey and convicted of blasphemy. See Complete Collections of the Works of Reeve and Muggleton, 1756, reprinted 1832.

Mughal, see MOGUL.

Mugla: 1. Is. of Asiatic Turkey, lying along the Mediterranean coast opposite the Dodecanese Is. Pop. 219,500. 2. Cap. of the above, about 10 m. N. of the Keune Gulf. Pop. 15,000.

Mugwort, or *Artemisia vulgaris*, tall bushy plant (order Composite) with pinnatifid leaves, green above, and white and woolly beneath, and red and brownish-yellow flower heads. Unlike wormwood (*A. absinthium*) M. is odourless, but it was formerly infused to make a remedy for rheumatism.

Mugwump, originally an Amer. political slang word (from the Algonquin word meaning 'big men') applied, in 1889, to those of the Republicans who would not vote for the candidature of J. G. Blaine for the presidency. It was used in Massachusetts of those who considered themselves great and independent and above mere party politics. It now signifies an independent voter, or one who will not attach himself to any party.

Muhila, see MOLLAH.

Mühlberg, tn. in the prov. of Saxony, Germany, on the Elbe, 35 m. N.W. of Dresden, was the scene of the defeat of the Protestant Elector of Saxony by the Emperor Charles V. in 1547. Pop. 3687.

Muhlenberg, John Peter Gabriel (1746-1807), Amer. preacher and soldier, b. in Trappe, Pennsylvania, son of the German-born Henry Melchior M. (1711-87), a Lutheran minister who in 1748 organised the Lutheran synod in America. He entered the Lutheran ministry, but gave up his clerical career when the War of Independence broke out. He raised the 8th Virginia regiment (Ger.), saw a great deal of service, and became brigadier-general in the continental army, 1777. He became vice-president of the Supreme Council in 1789, and was elected as a Democratic-Republican to the U.S. Senate in 1801, but resigned to become supervisor of revenues for the dist. of Pennsylvania.

Muhlenberg, William Augustus (1796-1877), Amer. clergymen, b. in Philadelphia. He founded the first Protestant Episcopal school in the U.S.A. Pub. *A Plea for Christian Hymns* (1821) and *Church Poetry* (1823).

Mühlhausen, tn. in Saxony, Germany, on the Unstrut, 30 m. N.W. of Erfurt. The church of St. Blasius dates from the twelfth century. There are manufcts. of woollen and linen goods, carpets, and leather. M. was a free city in the fourteenth century, and was the headquarters of Thomas Munzer in the Peasants' war (1525). Pop. 39,360.

Mühlheim, vil. of Hesse, Germany, 6 m. E. by N. of Frankfort-on-Main. Pop. 6000.

Mühlhausen, com. and vil. of Westphalia, Germany, 7 m. E. of Wuppertal. Pop. 7000.

Muir, Edwin (d. 1887), Scottish poet and novelist, b. in Orkney. His auto-biographical *The Story and the Fable* (1940) describes his early life on a remote Orkney is., and has achieved a high place. In his poetry he represents a significant

trend in modern verse, the return to contemplation of the primitive facts of humanity on earth, death, time, and love. His poetic works include *First Poems* (1925); *Chorus of the Newly Dead* (1926); *Six Poems* (1932); *Variations on a Time Theme* (1934); *Journeys and Places* (1937); and *The Narrow Place* (1943). He is also well known as a translator of Kafka, whose *The Trial* he trans., with Willa M., in 1937. His prose includes a trans. of Hermann Broch's *The Sleepwalkers* (1932); a work of criticism, *Transition* (1926); as well as *The Structure of the Novel* (1928); *John Knox* (1929); *Scottish Journey* (1935); and *Scott and Scotland* (1936). His novels include *The Marionette* (1927); *The Three Brothers* (1931); and *Poor Tom* (1932).

Muir, John (1810-82), Scottish orientalist, b. in Glasgow. In 1844 he was appointed prin. of Victoria College, Benares. In 1853 he returned to Edinburgh and endowed the chair of Sanskrit in the Edinburgh Univ.; he was the chief agent in founding the Shaw fellowship for moral philosophy. His *Original Sanskrit Texts* (5 vols., 1858-70) is a valuable source of information on the Hindu scriptures of the Veda.

Muir, John (1838-1914), Amer. naturalist, b. at Dunbar, Scotland, and educated at Wisconsin Univ. His journeys in California, Alaska, and elsewhere in America are described in *My First Summer in the Sierra* (1911); *A Thousand-mile Walk to the Gulf* (1916); *The Cruise of the 'Corwin'* (1917); and *Sleep Trails* (1918). See S. H. Young, *Alaska Days with John Muir*, 1915.

Muir, John Ramsay Brice (1872-1941), Brit. historian and Liberal politician; he was educated at Univ. College, Liverpool, and at Balliol College, Oxford. After a lectureship in modern hist. at Owen's College, Manchester, he accepted a similar appointment at Liverpool in 1900, becoming prof. 1906. From 1913 to 1921 he was prof. of modern hist. at Manchester Univ. His chief work is his monumental *Short History of the British Commonwealth* (vol. I., *The Islands of the First Empire*; to 1763; vol. II., *The Modern Commonwealth: 1763 to 1919*, 1922), a work which does not treat the overseas empire in isolation but in which such major topics as the gov. of India, the race for colonial possessions, the birth and development of imperialism, and of autonomy in what now are the dominions, take their due place in the vast setting of Brit. hist. His other works include *The Expansion of Europe* (1917); *British History: a Survey of the History of all the British Peoples* (1936); *The Record of the National Government* (1936); *Future for Democracy* (1939); and *The British Empire: How it Grew and how it Works* (1940), a pamphlet written to counteract the idea that the Brit. Empire was acquired by aggression and that it depends on great military power for its maintenance. M. was also a distinguished Liberal politician, and was Liberal M.P. for Rochdale from 1923 to 1924, though the House of Commons was not really his sphere so much as

party organisation. He was chairman of the organisation committee of the Liberal party, 1930-31; of the National Liberal Federation, 1931-33, president, 1933-36; and vice-chairman of the Liberal Party Organisation, 1936.

Muir, Sir William (1819-1905), Scottish orientalist, brother of John M. He entered the Bengal civil service in 1837, was appointed secretary to the governor of the N.W. Provs., and was in charge of the intelligence dept. during the mutiny. In 1868 he became lieutenant-governor of the N.W. Provs. In 1874 he was appointed financial minister for India. He retired in 1876 and was elected a member of the Council of India in London. He was also elected prin. of Edinburgh Univ. Through his influence the M. College at Allahabad was built and endowed. He was a keen student of Arabic. He wrote *Life of Mahomet and History of Islam* (1858-61); *Annals of the Early Caliphates* (1883); and *The Koran: its Composition and Teaching* (1885-87), etc.

Muiravonside, par. of Stirlingshire, Scotland, on the R. Avon, 34 m. S.W. of Linlithgow.

Muir Glacier, large ice-sheet of Alaska, N. Amer., with 350 sq. m. of surface area, discharging into Glacier Bay. The trunk is formed of about nine main streams of ice. Earthquake disturbances dislodged part of it (1899). Its most rapid summer movement is about 7 ft. per day, and some 200,000,000 cu. ft. of ice are daily thrown off into the bay. Since 1794 it has receded about 25 m.

Muirhead, John Henry (1855-1910), Brit. philosophical writer, b. in Glasgow. He was educated at Glasgow Academy and Univ., and at Balliol College, Oxford. Sometime assistant to prof. of Lat., Univ. of Glasgow, he became prof. of philosophy and political economy at the univ. of Birmingham. His books include trans. from Cicero and Aristotle; also *Elements of Ethics* (1892-1911); *Philosophy and Life* (1902); *The Service of the State* (1908); *German Philosophy in Relation to the War* (1915); *The Use of Philosophy* (1928); *Modern Idealism* (1930); and *The Rule and End in Morals* (1932). His greatest services to thought were rendered as editor of the *Library of Philosophy*, and of the series of personal statements in *Contemporary British Philosophy*.

Muirkrirk, tn. of Ayrshire, Scotland, on R. Ayr. There are mines of coal, limestone, and ironstone, and blast-furnaces. Pop. 4400.

Mui Tsai, Chinese system of domestic servitude, the M. T. being little girls sold, either directly or through middlemen, to their employers. The system, though modified, still (1940) prevails in Hong Kong, there being some 9000 M. T. in that colony. An inquiry was opened in Hong Kong in 1878, but the Chinese succeeded in confusing the system with adoption, though in reality a M. T. was seldom, if ever, regarded as a daughter and had no legal rights. One consequence of this otherwise abortive inquiry was the

formation of an officially recognised committee, known as the Po Leung Kuk, which conducted homes for women and children rescued from kidnappers. Sir John Hennessy (appointed governor of Hong Kong in 1877) also appointed a committee of investigation, but nothing was done to improve the lot of the M. T. as a result of its activities. In 1923 the Female Domestic Servants Ordinance was passed in Hong Kong, making it a criminal offence for any more M. T. to be taken into service or for an existing M. T. to be transferred from one person to another. The system is of course repugnant to all traditional ideas of Brit. liberty and is moreover conducive, though not necessarily so in Hong Kong, to immorality. It has sometimes been excused on the plea that it is no more than a Chinese custom of adoption; but there is no adoption of girls in the social customs of China. The system is deeply rooted; an attempt by Mr. Winston Churchill in 1922 to sweep away the abuse within a year failed. A Colonial Office Commission of Inquiry into the whole question of M. T. and of any surviving practices in Hong Kong and Malaya of transferring women and children for consideration showed no unanimity in its recommendations. Acceptance of the main recommendation of the majority report would have postponed abolition of the system for years. Miss Pitton Turberville's able minority report saw in the widespread custom of transferring children a loophole for evasion of the laws and she recommended the repeal of the M. T. law of Hong Kong of 1923 and that of Malaya of 1932 (both being mere registration laws) and the substitution of a new law to abolish the legal status of M. T., to protect children who have left their parents before the age of twelve, to settle the status of wards, and to continue registration for all these purposes indefinitely (see Colonial, No. 125, 1937).

Mukacevo, see MUNKACS.

Mukaddasi, see MOKADDASI.

Mukden, or Moukden (Chinese Shenyang), largest city of Manchuria, cap. of Liaoning, the S. prov. of Manchuria, and terminus of the Peiping-Mukden railway (832 m.); 110 m. N.E. of Ning-chwang, on a branch of the Siberian railway. The S. Manchuria railway connects it with Port Arthur and Dairen. The tn. is regularly built, surrounded by a solid brick wall and divided into nine parts. In the centre are the former imperial palace and the administrative buildings. It is an important tn. on the trade routes between the N. provs. and the rest of China. The chief exports are agric. produce and furs. There are railway workshops. The Fushun generating station, which provides M.'s light and power, has an output which has varied from 230,000 kilowatts before the Communist invasion to 40,000 kilowatts in 1948. Here too is the arsenal built after the First World War for Marshal Chang Tsu-lin, the Manchurian war lord, by the Englishman, 'one-armed Sutton'. The Jap. during their occupation of the puppet state of Manchukuo, created an extensive factory quarter, but by 1948 it

had become a wilderness of disused plant. M. suffered from fire during the Boxer rising of 1900. It was the scene of a Jap. victory over the Russians in March 1905 (see K. von Donat. *The Battle of Mukden*, Eng. trans., 1906). In 1948, prior to the Communist irruption, there were twenty-five Scottish and Irish Presbyterian missionaries who had a hospital, a medical school famous throughout Manchuria, and various schools and churches. M. was besieged by Chinese Communists for a year from the summer of 1947 and then by-passed, falling ultimately to them at the end of Oct. 1948. The pop. in July 1946 was 863,500; in 1948 it was estimated at 1,200,000, swollen by refugees; many of the inhab. endured great privations during the Communist investment, subsisting on a staple diet of gruel made from soya-beans. See CHINA, History.

Mula, tn. of Murcia, Spain. There are warm mineral baths near, and trade in agric. produce, wine, and oil is carried on. Pop. (com.) 14,300.

Mulatto (Sp. and Portuguese *mulato*, a dimin. of *mulo*; Lat. *mulus*, a mule), the offspring of a white person and a Negro. The true M. is characterised by woolly black hair, and flat features, and is more usually the child of a black mother and white father. The degrees of Negro blood are, or were, indicated by *quadroon*, three-fourths white and one-fourth black, and *octofoon*, seven-eighths white, and one-eighth black, etc. But special countries have different terms for Ms. In Lat. America they are sometimes called *mestizos*, and in Brazil a M. is a *pardo*.

Mulberry (*Morus*), genus of fruit-bearing trees of which the best known is the black M. (*M. niger*), a native of Persia, and introduced to Britain in the sixteenth century. It is hardy only in the S. of England, and elsewhere needs to have the shelter of a high sunny wall. The sub-acid characteristically flavoured fruit, though it resembles a blackberry or raspberry, is of quite different structure, corresponding rather to a bunch of currants. The leaves are used as food for silkworms, but those of the white M. (*M. alba*), which is not so hardy, make the finest silk.

'Mulberry' Harbour, see under ARNOMANCHES, HARBOUR OF.

Mule, name given to any hybrid, but commonly the offspring of the male ass and the mare. The produce of a stallion with a female ass is called a ' hinny,' and is smaller and weaker than the M., and therefore less valuable. Ms. have the general shape of the horse, and sometimes measure as much as sixteen hands high, but from the ass they get its obstinate disposition, the head features, and the less sensitive, weatherproof coat. As a rule they are extremely hardy and practically free from disease. They are as sure-footed as a goat, and almost invariably possess great intelligence. They are bred in large numbers for use in countries where roads are bad and extremes of weather have to be survived. They are useful as pack animals.

Mule (spinning machine), see under COTTON SPINNING AND MANUFACTURE.

Mulgrave, Earl of, see SHEFFIELD, JOHN. **Mülheim**: 1. Am-Rhein, tn. in the Rhine prov., Germany, on the Rhine, nearly opposite Cologne, of which city it is now a part. It has breweries, tanneries, and dye-works, and manufs. of silk, velvets, chemicals, machinery, and carriages. Pop. 60,000. 2. Am-Ruhr, tn. in the Rhine prov., Germany, on the Ruhr, 16 m. N. of Düsseldorf. Coal and iron are mined in the dist., and there are manufs. of machinery, textiles, leather, and glass. Pop. 137,000.

Mulhouse, city in the Haut-Rhin dept., France, on the Ill and the Rhine-Rhône canal, 67 m. S.S.W. of Strasburg by rail. It is divided into the old tn., dating from the sixteenth century, and the new tn. built in the nineteenth century, and containing the workmen's colony founded by Mayor Dollfus in 1853. It is an important centre of the textile industry: other manufs. are machinery and chemicals. M. became Ger. in 1871, but reverted to France after the First World War. It was occupied by the Ger. in 1940, and liberated by Franco-American forces on Nov. 22, 1944, having suffered severe damage. Pop. 97,000. See further under WESTERN FRONT IN SECOND WORLD WAR.

Mulinari, or Molinari, Stefano (c. 1741-1796), It. engraver, b. in Florence. Little is known of his life, but his reputation rests on his numerous prints of early It. masters, from Cimabue to Francesco Rustici, which he pub. in 2 vols., under the titles *Isotria practica dell'Incomincamento e Progresso della Pittura* (1775) and *Saggio delle cinque Scuole di Pittura Italiana* (1780).

Mull, after the Isle of Skye the largest of the Inner Hebrides, Argyllshire, is washed on the W. and S. by the Atlantic. It is 7 m. W. of Oban and is separated from the mainland by the firth of Lorne and the sound of M. Its coast is indented by numerous sea lochs, of which the prin. are Loch-na-Keal and Loch Scridain. Area 351 sq. m. Its surface is mountainous, rising in Ben More to 3185 ft. Chief tn. Tobermory. Pop. about 4000.

Mullah, see MOLLAH.

Mullein, genus *Verbascum*. *V. thapsus* is the great or common M., a biennial herb, with a cluster of large, woolly leaves 12 to 18 in. long, in its first year. In the second year's growth it has a stout woolly leafy stem, 3 ft. high and terminating in a spike of yellow flowers. The wool from stem and leaves was at one time used for lamp-wicks. *V. lychnitis* is the white M., *V. pulverulentum*, the yellow hoary M., and *V. nigrum*, the dark M. All these and *V. thapsus* grow wild in some places in Britain.

Müller, Sir Ferdinand von (1825-96), Ger. botanist and explorer, b. in Rostock. From 1846 to 1857 he studied at Kiel Univ., also botanising in Schleswig and Holstein, and then emigrated to Australia through ill health. From 1848 to 1852 he travelled some 4000 m. botanising in

1852 was appointed chief botanist to Victoria, and in 1855–56 he was botanist in A. C. Gregory's scientific expedition in N. and Central Australia. On his return he was made director of the botanical gardens in Melbourne. He introduced and exchanged plants with countries all over the world, and he will be chiefly remembered for introducing the eucalyptus-tree into different countries, especially Algeria; he also raised the famous Victoria Regia water-lily. M. wrote valuable works on the eucalyptus, various botanical subjects, and *Fragmenta phytographica Australiae* (11 vols., 1862–81), also *Flora Australiensis* (with G. Bentham, 1860–65) and *The Plants indigenous to the Colony of Victoria* (1860).

Müller, Friedrich Max (1823–1900), Anglo-Ger. philologist and orientalist, b. at Dessau, where his father, Wilhelm M., was librarian of the ducal library. He studied at Berlin and Paris. The E. India Company commissioned him to edit the *Rig-Veda* at their expense, and this work brought him to England in 1846 to consult the MSS. in the E. India House and the Bodleian Library. He settled at Oxford in 1850 upon his appointment as deputy Taylorian prof. of modern languages. Four years later he succeeded to the professorship. He became connected with the Bodleian Library in 1856, and from 1865 to 1867 was curator of oriental works. In 1866 he was made prof. of comparative philology. He was made a member of the Privy Council in 1896. His works include *Comparative Philology* (1858); *A History of Ancient Sanskrit Literature* (1859); *Lectures on the Science of Language* (1861–64); *Handbooks for the Study of Sanskrit* (1865–70); *Chips from a German Workshop* (1868–75), etc. He ed. the *Sacred Books of the East*, and pub. trans. of various oriental works, and of Kant's *Critique of Pure Reason*. His collected works were pub. in 20 vols., 1898–1903. See his *Ald Lang Syne* (1898).

Müller, George (1805–98), Brit. preacher and philanthropist, b. near Halberstadt in Germany. He became minister of a church in Teignmouth, Devonshire, where he remained for two years and then went to Bristol. He estab. a large orphanage for 2000 children at Ashley Down, just outside Bristol. His book, entitled *The Lord's Dealings with George Müller*, had an immense circulation, and roused much sympathy with his scheme. See A. T. Pierson, *George Müller of Bristol*, 1899.

Müller, Hermann (1876–1931), Ger. Socialist statesman, b. May 18 at Mannheim. He ed. the Socialist paper *Görlitzer Volkszeitung* and was sent abroad by Ger. Socialists, 1911, to see whether foreign Socialists would join Ger. Socialists in a no-war movement. For some time he ed. *Vorwärts*. He was minister for foreign affairs in the Bauer Cabinet, 1919, and signed the treaty of Versailles. On the failure of the Kapp putsch, he became chancellor for a few months, 1920. In June 1928 he was chancellor again, and formed a Grand Coalition, which lasted till March 27, 1930.

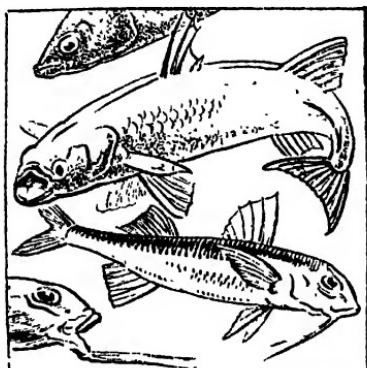
Müller, Hermann Joseph (b. 1890), Amer. geneticist, b. in New York city. He was prof. at the univ. of Texas, 1925–36; on the staff of the Institute of Genetics and of the Medicobiological Institute, Moscow, 1933–37; and of the Institute of Animal Genetics, univ. of Edinburgh, from 1938. He was prominent in experimental work in mutation and radiation genetics, and a strong supporter of the neo-Darwinian theory. His chief experimental work has been carried out with the culinary plants of the order *Drosophila*. M. discovered the action of X-rays on chromosomes and genes (1927), giving proof that the rays cause mutations. Others had worked on similar lines before 1927 though without definite success, and in 1928 Stadler announced positive results of independent X-ray experiments with plants. Hence it was not the mere discovery of metagenic action of X-rays which revolutionised genetics, but the manner in which M.'s previous labours had prepared the way for the use of it, and the skill with which he exploited it. He was awarded the Nobel prize for physiology and medicine in 1946. Pub. papers on *Reversibility in Evolution* and *The Role of Isolation and Temperature in Evolution*.

Müller, Johann (1801–58), Ger. physiologist, b. at Koblenz. He began to study with a view to orders in the Rom. Catholic Church, but in 1819 he abandoned his theological studies, and devoted himself to medicine. Whilst yet a student he wrote for a prize the treatise *De Respiracione Foetus* (1823). He became in 1830 prof. of physiology and anatomy at Bonn, and in 1833 succeeded Rudolph as prof. of anatomy at Berlin. His works are occupied with zoology and comparative anatomy. His investigations on infusoria were pub. in 1860.

Müller, Johann, Ger. astronomer, see REGIOMONTANUS.

Müller, Johannes von (1752–1809), Swiss historian, b. at Neukirch, near Schaffhausen. In 1772 he became prof. of Gk. at the Collegium Humanitatis at Schaffhausen. During 1778 and 1779 he delivered a set of lectures on hist. which were pub. many years later under the title *Vierundzwanzig Bücher allgemeiner Geschichte* (1839). In 1780 he pub. the first vol. of his *Geschichten der Schweizer*, and the following year his *Essays historiques* appeared. The same year he was made prof. of hist. by the landgrave of Hesse Cassel, and in 1782 he pub. *Reisen der Pasto*. In 1786 he became librarian to the elector-archbishop of Mainz, and the first vol. of his Swiss hist. appeared, and further vols. appeared between 1788 and 1808. In 1877 he pub. a political tract, *Zur Darstellung des Fürstenbundes*. In 1806 he espoused the cause of Napoleon, and the latter made him secretary of state for Westphalia, and later a privy councillor and director of public instruction. See lives by Hoeren, 1809; Döring, 1835; Monnard, 1839; K. Henkling, 1909, 1928; and W. Stokar, 1938. See also A. Jaggi, *Müllers Geschichtsauffassung*, 1922.

Müller, Karl Otfried (1797-1840), Ger. archæologist, b. at Brieg in Silesia, educated at Breslau and Berlin. He pub. *Aegineticorum liber* (1817), after which he soon received an appointment to the Magdaleneum in Breslau. In 1819 he obtained an archæological chair in Göttingen. His great design was to embrace the whole life of ancet. Greece, its art, politics, industry, religion, in one vivid conception. He obtained permission to travel, and made tours in Greece and Italy, but d. of an intermittent fever at Athens. We are indebted to him for many striking elucidations of the geography and topography, literature, grammar, mythology, manners, and customs



MULLETS

Above, grey mullet; below, red mullet.

of the ancients. His works include *Prolegomenen zu einer wissenschaftlichen Mythologie* (1825); *Über die Wohnsitze, Abstamzung und ältere Geschichte des Makedonischen Volks* (1825); *Die Etrusker* (2 vols., 1828); *Handbuch der Archäologie der Kunst* (1830, Eng. 1850); *History of the Literature of Ancient Greece* (trans. by Sir G. C. Lewis and Dr. Donaldson, 1840); and *Geschichte hellenischer Stämme und Staaten* (1844). The facts of his life were recorded in Lücke's *Erinnerungen an Otfried Müller*, 1841. See also study by O. and E. Kern. His letters were pub. in 1936.

Müller, Wilhelm (1794-1827), Ger. lyric poet, b. at Dessau. In 1817 he went to Italy, and his first pub. work was *Rom, Römer und Römerinnen* (1820), which gave his impressions of his visits. The same year he was made librarian of the ducal library. His best work is contained in the vols. entitled *Gedichte aus den hinterlassenen Papieren eines reisenden Waldhornisten* (2 vols., 1821-24) and *Lieder der Griechen* (1821-24), the latter sympathising with the Gks. in their struggle with the Turks. His earliest lyrics will be found in a vol. of poems entitled *Bundesblüten* (1816), containing work by sev. authors. His other works are *Homerische Vorschule* (1824); *Neu-*

griechische Volkslieder (2 vols., 1825); and *Lyrische Reisen und epigrammatische Spaziergänge* (1827). He also trans. Marlowe's *Faustus*, and ed. *Bibliothek der Dichtungen des 17. Jahrhunderts* (10 vols., 1822-27). Many of his poems were set to music by Schubert, and have become extremely popular. See ed. of his *Gedichte*, by his son, F. Max-Müller, 1868.

Mullet, term for two distinct fish types: (1) The grey M. (*Mullus*) comprises about seventy species, of which three are found off the Brit. coast. They are valued as food, especially when taken from fresh water, and they are cultivated in M. ponds in Italy and also in Honolulu. (2) The red M. (*Mullus*) comprises about forty species, many of which are tropical. The common red M. (*M. barbatus*) has been fished since classical times for its delicately flavoured flesh. Its average length is about 15 in., and weight 24 lb. Its skin is a brilliant red. Red Ms. have a pair of erectile barbels which project downwards and forwards when the fish is feeding on the sea bottom and which lie back in grooves at other times.

Mullingar, markt. tn. of Eire, cap. of the co. of Westmeath, is situated on the Brosna, 48 m. W. by N. of Dublin. It has a Rom. Catholic cathedral. Tanning and brewing are carried on, and it has ann. cattle and horse fairs. Pop. 5237.

Mullion, term in Gothic architecture applied to the upright bars, or stone shafts, dividing the general aperture of a window into secondary openings, which are again frequently subdivided vertically by similar shafts crossing the Ms. horizontally, and are therefore called 'transoms'.

Mullion, vil. of the Lizard dist., Cornwall, England. Its church is dedicated to St. Melan; the interior has some very fine carved bench-ends, perhaps the best in the whole co. There are splendid views across Mount's Bay to Penzance. The scenery of M. Cove, which is about a mile from the vil., rivals that of any cove in Cornwall. Above rise on all sides, lichen-covered cliffs, rocks piled on rocks, vaulted and ribbed, with chasms and natural arches like the ruins of a vast fane. The cove or harbour, with its jetties and fish cellars and the nearby M. is, were presented to the nation in 1945. About 1 m. W. of M. is the Marconi memorial, set up in 1937 to commemorate the fact that on Dec. 12, 1901 at 12.30 midday, Marconi, in Newfoundland, received a morse signal sent from this spot, the first ever heard across the ocean. Here also, twenty-two years later, the short-wave beam system, which revolutionised long-distance communications, was successfully tested.

Mulock, Dinah Maria, see CRAIK, Mrs.

Mulready, William (1786-1863), Irish genre painter, b. at Ennis, in co. Clare. His father removed to London soon after Wm. was born, and here Wm. had the help of Banks, the sculptor. In 1800 he was admitted as a student of the Royal Academy, and in 1815 an associate. His pictures are noted for their rich colouring and their perfection in details, and the

most important are in the S. Kensington Museum and the National Gallery, London, e.g. 'Choosing the Wedding Gown,' 'Crossing the Ford,' 'A Roadside Inn,' 'The Barber's Shop,' and 'Punch.' He was well known for his illustrations for *The Vicar of Wakefield*.

Mulso, Hester, see CHAPONE.

Multan, or Mooltan, anct. and important city of Pakistan in the Punjab, 200 m. S.W. of Lahore, on a mound consisting of the ruins of anct. cities that occupied the same site, 3 m. from the l. b. of the Chenab, the inundations of which sometimes reach M. It is also the headquarters of a dist. and of a div. of the same name. Pop. 142,800.

Multatuli, see DEKKER, EDWARD DOUVRES.

Multiplepointing, in Scots law, denotes an action, apparently first mentioned in an Act of Sederunt, 1677, as the proper process for settling the preferences of different arresters (see ARRESTMENT), whereby any number of different claimants to the same money, effects, or property can obtain the decision of the court on the question of which is entitled, or, if more than one, in what proportions they are entitled. The subject-matter, however, is generally a sum of money, and must be such as the 'witt' may be obliged to pay; hence rents to become due cannot be the subject of M. Usually M. is only competent where conflicting claims have been made, or where conflicting interests exist which may mature into claims. See G. J. Bell, *Commentaries on the Laws of Scotland*, and Green's *Encyclopaedia of Scots Law*.

Multiple Proportions, see CHEMISTRY.

Multiple Stars. The name 'binary' or double star is given to a family of two stars relatively isolated in space, and the name 'multiple' is given to such an isolated family consisting of three or more individual members. Although large numbers of binaries have been discovered the number of known M. S. is not very great. The present theory of the origin of M. S. begins with binary stars (see ASTRONOMY). The sequence of events that leads to the formation of M. S. from a binary star is as follows. The components lose weight by radiation and the progressive shrinkage is accompanied by increased speed of rotation (Law of conservation of angular momentum). This rate of increase is no doubt diminished by the effect of tidal friction caused in the liquid star by the gravitational attraction of its neighbour; but if development takes place the time arrives when the speed of rotation of the liquid mass is so great that the now oblate spheroid develops a 'neck' so that it virtually consists of two portions—the major part being the body and the smaller part the head. The fission takes place at this neck when the speed of rotation has further increased and the final result is a small star revolving round its parent. The N. Pole star is an example of a multiple star. It is known as a spectroscopic triple and consists of two stars revolving round a third star that is invisible to us. Castor is a multiple

star; originally a visual binary, each component has been subdivided in the way described above and it now consists of two spectroscopic binaries. In every case the 'parent' star is much larger than its 'child,' and the period of the subsystem is much smaller than that of the original binary, the distance between the components of the sub-system being again considerably less than the distance between the components of the binary. Further subdivision of the M. S. may take place, though few examples of this occurrence are known. The above theory is purely tentative. See H. Spencer-Jones, *General Astronomy*, 1922; H. Macpherson, *Modern Astronomy*, 1926; and Sir J. Jeans, *The Universe Around Us*, 1929.

Mumbij, see HIERAPOLIS.

Mumbles, or Oystermouth, seaside resort in Glamorganshire, Wales, on Swansea Bay, 5 m. S.W. of Swansea, noted for its oyster fisheries. There is a lighthouse on a small is. off M. Head.

Mummius, Lucius, surnamed Achaeus, Rom. general, was consul in 146 B.C., and after the conquest of Dileus in the Achaean war captured Corinth. All the inhab. were slain, the artistic treasure sent to Rome, and the city burnt. It is probable that these cruel proceedings, which were foreign to M.'s nature, were carried out by order of the Senate. He was censor in 142 with Scipio Africanus the Younger.

Mummy (Arabic, *mumiya*, bitumen). Name given to a dead body preserved by a process of embalming. It has been suggested that the origin of embalming in Egypt was to be traced to a dearth of fuel for cremation purposes, or to the impracticability of burial in a soil that was annually disturbed by the inroads of the Nile. It is more probable, however, that the custom originated in a desire to preserve the body for the needs of a future life. The anct. Egyptians embalmed not only human beings, but also sacred animals such as cats and crocodiles. To postpone natural decay, the body was at first steeped in natron; later methods involving the use of bitumen, spices, drugs, and honey were introduced. From the twenty-first dynasty onwards, brain and viscera were removed, the body-cavities repacked, the whole enswathed in smeared linen bandages inscribed with ritual texts and enclosed with amulets and faience statuettes in a mummy-case. The practice ceased about A.D. 700. Modern embalming dates from the eighteenth century, and various methods have been used. The famous anatomist, Wm. Hunter, used essential oils, camphor, salt petre, pitch, or resin. Later fluids were injected, composed of sodium chloride, alum, potash, glycerine, or composed of alkalis, arsenic, and alcohol. The earliest attempt at mummification so far discovered came from a second dynasty tomb at Sakhera. (See illustration, p. 454.)

Mumps, infectious disease characterised by inflammation of the parotid glands, and at times of the other salivary glands. Other names for the disease are *parotitis*, *cymanche parotidea*, and, in Scotland, the 'branks.' The infection is presumably



E.N.A.

THE MUMMY OF RAMESSES II.
GIZEH MUSEUM

caused by a virus. After a period of incubation of from two to three weeks, the disease shows itself by a swelling in the region of the parotid gland, which is situated in front of and below the external ear. There is also usually some degree of catarrh, with slight febrile symptoms, but these are seldom pronounced enough to occasion discomfort. As the disease proceeds the swelling becomes increased in size and spreads downwards to the neck and round the angle of the jaw, causing comparatively little pain but considerable disfigurement. The patient is otherwise quite well, except for some amount of discomfort attached to the actions of masticating and swallowing. It takes about four or five days for the swelling to reach its height, after which it gradually abates to a normal condition. Suppuration of the gland is a very uncommon occurrence. The disease does not call for much treatment. The diet should be that proper to a febrile condition, and the food should be soft enough to avoid painful mastication. The disease is highly infectious, and sometimes spreads with great rapidity among young children. Affected persons rarely take it a second time. It occasionally happens that other glands are sympathetically affected, particularly the testicles in males, and more rarely the ovaries in females, sometimes also the pancreas, but the inflammatory condition is usually only temporary, and passes off when the parotids take on their normal size and appearance.

Mun, Thomas (1571-1641), Eng. writer on political economy. He was a member of the committee of the E. India Company. In 1621 he wrote and pub. *A Discourse of Trade from England unto the East Indies*; and c. 1630 wrote *England's Treasure by Foreign Trade*, a statement of the Mercantilist doctrine of economic self-sufficiency by the creation of an overall trade balance; this latter was pub. by his son, John M., 1661. See R. Cranchet, *L'œuvre économique de Thomas Mun* (Angers, 1921).

München, see MUNICH.

München-Gladbach, see GLADBACH.

Munchhausen, Karl Friedrich Hieronymus, Baron (1720-97), famous for narrating marvellous stories. Born at Hanover, he served in the Russian Army against the Turks, and on his retiring to his estate of Bodenwerder, amused and astounded his friends and relations by the extraordinary tales of his adventures during the war. A man named Rudolf Erich Raspe (q.v.) collected these tales and, adding many incidents from other sources, pub. a book in 1785 called *Baron Munchhausen's Narrative of his Marvellous Travels and Campaigns in Russia*. It was pub. anonymously with a preface by G. Bürger, who was at first believed to be the author; a second ed. was printed in 1786, and two other eds. rapidly followed. A. Cruikshank illustrated one ed. (1869) and Gustave Doré (1862) another. The book has been enlarged by the insertion of stories culled from various sources. The text of *Munchhausen's Travels*, as usually reprinted, is, as shown by John

Carswell, 'the product of a long tradition of revision and improvisation' and Raspe himself was the author of less than a sixth part of what is printed in Carswell's text. Raspe had some hand in the authorship of the second installment, *The Sea Adventures*, produced by a London publisher named Smith. In these M. begins by embarking at Portsmouth for N. America, is stranded on a whale's back and, later, a tree, then returns to his Turkish experiences, and eventually takes off from Cornwall (where Raspe wrote *Munchhausen*) in a balloon. In this account another baron, de Tott, founded on well-known Fr. Hussar, is introduced, partly as a foil to M., partly as a convenient medium for attacking the Catholic Church. In Carswell's ed. the first and second sections, Raspe's original text and the Raspe-Smith second installment, *The Sea Adventures*, now appear (1948) uncorrupted for the first time in Eng. since their original pub. in 1785. See R. E. Raspe and others, *Singular Travels, Campaigns and Adventures of Baron Munchhausen* (ed. by J. Carswell), 1948.

Muncie, co. seat of Delaware co., Indiana, U.S.A., 54 m. N.E. of Indianapolis, on the White R. Iron, steel, and glass goods are manufactured. Palmer Univ. is here. Pop. 49,700.

Munday, or Mundy, Anthony (1553-1633), Eng. dramatist and miscellaneous writer, b. in London. He went to Rome (1578), probably as a spy to report on the Eng. Jesuit College there. On his return to England (1579) he became an actor, and later a member of the earl of Oxford's company. He wrote anti-Catholic pamphlets and trans. romances. In 1605 he was appointed chief pageant writer for the city, and by these entertainments he won his greatest fame. There are eighteen plays ascribed to M., among them *The Downfall of Robert Earl of Huntington*, the second play on the *Death of Robert of Huntington*, and *John a Green and John a Cumber*, etc. He wrote sev. lyrics, some under the name of 'Shepherd Tony,' to *England's Helicon* (1600). He also wrote under the title of 'Lazarus Plot.' M. pub. an enlarged ed. of Stow's *Survey of London* in 1618. Ben Jonson nicknamed him 'Antonio Balladino, the pageant poet.' See life by C. Turner, 1928.

Munden, Joseph Shepherd (1758-1832), Eng. actor, b. in London. After playing in strolling companies he made his mark at Canterbury under Hurst. In 1790 he came to London, where, until about 1811, he was the leading comedian. He was remarkable for the variety of characters he represented, and had a great gift of facial expression. See Charles Lamb, *Essays of Elia*.

Münden, tn. in the prov. of Hanover, Germany, at the confluence of the Fulda and the Werra, 15 m. W.S.W. of Göttingen. It has manufs. of confectionery, chemicals, cigars, carbondum, and rubber. There are quarries and coal-mines in the dist. Pop. 12,520.

Mundesley, vil. and seaside resort of Norfolk, 7 m. from Cromer and 135 m.

from London by the E. Region railway. About 2 m. to the S. is Paston, noted for the fifteenth-century family of that name (see PASTON LETTERS). Close by is Trimingham, said to be the highest point in Norfolk. Also near it and to the S. is Bacton, noted for its abbey ruins. Pop. 800.

Mundrucus, or Mundurucus, tribe of Brazilian Indians, S. of the Amazon, on the R. Tapajos, generally classified with the Tupi stock.

Mongoose, see MONGOOSE.

Mungo, Saint, see KENTIGERN.

Munich (Ger. München), the cap. of Bavaria, is situated in the midst of a barren and flat elevated plain at a height of about 1700 ft. above the level of the sea. It is also the prin. city of the prov. of Upper Bavaria and lies on the l. b. of the Isar. Its cathedral, which is the seat of the archbishopric of Munich-Freising, was built between 1168 and 1494, and is remarkable for its two square towers, with their octagonal upper storeys, capped by cupolas, and its thirty lofty and highly decorated windows. Among the notable buildings were the royal residence, the Pinakothek, the Glyptothek, the National Theatre, the National Museum, and the Court of Justice. Its public library contains over 1,300,000 vols., and is rich in art collections. M. is noted for its enormous breweries of Bavarian beer, and has factories for cotton, wool, and damask goods, jewellery, silver articles, mathematical instruments, machinery, leather goods, wax-cloth, paper-hangings, carriages, pianos, gold, silver, and steel wares, etc. Lithography is extensively engaged in. Like most other industrial cities of Germany, its activities in the years immediately preceding and during the Second World War were chiefly concerned with the manuf. of munitions. The present name of this city cannot be traced further than the twelfth century, when Henry the Lion raised the Villa München from its previous obscurity by establishing a mint within its precincts, and making it the chief emporium for the salt which was obtained from Halle and the neighbouring dists. In the thirteenth century the dukes of the Wittelsbach dynasty selected M. for their residence, built the Ludwigsburg, some parts of whose original structure still exist, and surrounded the tn. with walls and other fortified defences. In 1327 the old tn. was nearly destroyed by fire, and rebuilt by the Emperor Ludwig of Bavaria very much on the plan which it still exhibits, but it was not till the close of the eighteenth century, when the fortifications were razed to the ground, that the limits of the tn. were enlarged to any extent. The city capitulated to Gustavus Adolphus in 1632, and in 1742 it fell into the hands of the Austrians. King Maximilian II. (1848-64) did much to further the arts and sciences by founding the National Museum. Here, in June 1940, Hitler summoned Mussolini to discuss the terms of the armistice with France. It was first raided by the R.A.F. on Sept. 1, 1940. In a speech to old members of the

Nazi party in the Lowenbrau cellar, on Nov. 8, 1940, Hitler declared himself to be the 'hardest man the German people have had for decades, perhaps for centuries.' On the same day the R.A.F. raided M. for two hours, and one of their bombs hit the beer cellar where the annual Nazi celebrations were held, but Hitler had escaped. More than 500 tons of high explosive and incendiary bombs were dropped by the R.A.F. on the industrial and railway centres of M. on the night of March 9, 1943. In this raid the Glyptothek, Pinakothek, and Schack art galleries were destroyed, but their contents had been removed to places of safety. The galleries were close to the group of buildings which constituted the Nazi headquarters. M. fell to the W. Allies in the course of the final thrust by Gen. Devers's Seventh Amer. Army, which began on April 22, 1945, two days after the fall of Nuremberg. On the right flank the 15th Corps moved down the Danube and then struck S. to M., which was captured, in the face of some opposition, on April 30. Pop. (1939) 828,323, (1947) 760,929. See also MUNICH PACT.

Munich Pact, agreement made at Munich between Hitler, Neville Chamberlain, Mussolini, and Daladier on Sept. 29, 1938, providing for the cession of the Sudetenland to Germany. War was imminent owing to Fr. guarantees of Czech independence and Chamberlain flew to Berchtesgaden, Hitler's residence, to dissuade Hitler from war. As a result he agreed with Daladier to recommend the Czech Gov. to surrender all districts containing more than fifty Gers. This did not satisfy Hitler, and Chamberlain flew a second time to Germany, meeting Hitler at Godesberg. Hitler now increased his demands for the surrender of a much larger zone, with the result that Franco and Britain mobilised and recommended Czechoslovakia to do the same. At this point Mussolini suggested that another conference should be held, and Chamberlain and Daladier accordingly met him and Hitler at Munich on Sept. 28, 1938. Although Hitler's terms were only slightly modified, they were accepted, Chamberlain returning to London with the worthless agreement in his pocket and the belief, evidently sincerely entertained, that he 'had brought back peace in our time.' The pact provided for a guarantee of the new frontiers created after the Ger. Army had marched into Czechoslovakia (Oct. 1) by all the signatories. Chamberlain and Hitler also signed a joint declaration ruling out war between their two nations. In France as well as in Britain the agreement was welcomed with popular relief; but soon voices were raised criticising it as a mere surrender, and it gradually became totally discredited as the last stage of the futile policy of 'appeasement.' Further light is thrown on the hist. of the M. crisis by the pub. (Sept. 1949), by the U.S. Dept. of State, under the title *Germany and Czechoslovakia, 1937-1938*, of a vol. of documents from the captured archives of the Ger. Foreign Office. (A vol. entitled *From*

Neurath to Ribbentrop, Sept. 1937-1938 was pub. earlier.) The later vol. shows that the Ger. state secretary, Baron von Weizsäcker, at the end of Aug. 1938 remained opposed to a Czech war, but that *The Times* leading article of Sept. 7, suggesting that Czechoslovakia should cede the border areas to Germany, and Chamberlain's offer to fly to Germany, so far from facilitating a pacific solution, evidently helped to stiffen the Ger. attitude. It was the entirely mistaken conjecture of the Ger. *charge d'affaires* on Sept. 8 that *The Times* article may have reached *The Times* editorial staff from the



NEVILLE CHAMBERLAIN
AT BAD GODESBERG

The Prime Minister leaving the Hotel Dresden after his meeting with Hitler on Sept. 29, 1938.
On the left is von Ribbentrop.

Prime Minister's entourage.' However that may be, it is hardly surprising that after a further meeting between Chamberlain and Hitler had been arranged for Godesberg on Sept. 22-23, Hitler declared that he would present the Ger. demands 'with brutal frankness.' In another document it is stated that on the day of the conference at Munich, Count Schlürenburg, Ger. ambas. in Moscow, called upon Potemkin, acting chief of the Soviet Ministry of Foreign Affairs. Potemkin showed visibly his annoyance at the course events had taken. Commenting on Hitler's declaration that Germany had no further territorial claims in Europe, he said 'it was not certain whether Nazi doctrine regarded the Soviet Union and Soviet Ukraine as being in Europe.' See further under CZECHOSLOVAKIA and EUROPE, *History during the Second World War*.

*See J. W. Wheeler-Burnett, *Munich: Prelude to Tragedy*, 1948; R. W. Seton-Watson, *Munich and the Dictators*, 1939; and *Documents on British Foreign Policy: 3rd series, vol. i.*, 1938 (ed. by E. L. Woodward and R. Butler), 1940.*

Municipal Corporations, see LOCAL GOVERNMENT.

Municipality (derived from Lat. *municipium*), term which came subsequently to denote the duties (*munus*, duty or privilege) undertaken, and the privileges accepted, by the various It. tns. and other communities which stood in dependence on the city of Rome. Later the term *municipia* was applied to all urb. communites of Rom. citizens in Italy with a definite organisation and a more or less complete system of self-government. The term M. thus became the appropriate generic name both for cities or tns. which enjoyed a measure of local autonomy, and for the conventional governing body of such cities or tns. In England the most anct. Ms. are those bors. which can show an unbroken hist. back to the Middle Ages or earlier, when, in consideration of certain payments (like the *firma burgi*) they received royal charters of self-taxation and self-government. Other and later municipal corporations include principally large manufacturing tns., which have acquired the status of co. or non-co. bors. by charter or private Act of Parliament. (See BOROUGH; BURGESS; CORPORATION; LOCAL GOVERNMENT.) In most cases of anct. bors. hist. justifies the assumption that the municipal corporation of mayor, aldermen, and burgesses, or at least the common council, arose out of the Merchant and Craft Guilds, for these latter possessed a common stock and corporate trading ventures which gave them both the wealth and the local organisation essential to the conduct of corporate affairs. Ms., not dissimilar in some of the essentials of Eng. municipal corporations, exist in many countries; but those in the U.S.A. differ in one important respect, in that the various grades of members of the commonality form distinct chambers under a bicameral system which reveals, as it were, the microcosm of a national or state legislature. In Germany tn. constitutions varied very considerably. In Prussia the executive council (*magistrat*) of a municipal com. was elected by the representative assembly of the citizens out of their own body; but in other parts of Germany the executive was elected by the entire body of municipal electors.

Hist. shows that the M. com., or other urb. corporate entity endowed with local autonomous privileges has at various times arrogated to itself such formidable political ascendancy as to render itself practically independent. N. Italy, at the time of the Lombard kings, and long before the hegemony of the last century, was essentially a region of independent city republics, each with an organisation not markedly dissimilar from that of the city state of anct. Greece, and owing its anomalous position to the opportunities for the local tyranny of dukes and counts afforded by the feudal system. This

aristocratic or caste tyranny was undermined only by the rival spiritual power set up under the aegis of the Christian empire by the grant of episcopal immunities, with the result that the It. city republics presented the curious political phenomenon of a dual system of control, the religious and democratic acting as a counterpoise to the temporal and ducal. By much the same process of evolution rose and waned the free tns. of Germany (see FREE IMPERIAL CITIES) and the cities of the Swiss cantons. The Eng. bors. or chartered tns. had a different hist. As the natural centres of trade they were early in a position to exact from necessary overlords or needy monarchs fiscal and judicial immunities which soon enabled them to develop themselves into compact strongholds, with resources that in times of civil war or social upheaval were enough of themselves to decide the fate of contending factions in the state. The municipal corporation of England during the nineteenth century acquired by legislation and custom wide powers of self-government, but as the power of the central gov. increased and the services undertaken by municipal corporations became of increasing national importance their powers were curtailed so that now there is extensive control, especially from the financial aspect, of their powers by the central gov. See H. J. Laski (ed.), *A Century of Municipal Progress*, 1935; J. Tait, *The Medieval English Borough*, 1936; G. M. Harris, *Municipal Self-Government in Britain*, 1939; Helen Camm, *Liberties and Communities in Medieval England*, 1944; Lord MacMillan (ed.), *Local Government Law and Administration*, 1945; and J. H. Warren, *Municipal Administration*, 1948.

The Eng. system of municipal administration was the model on which the early cities and tns. of the U.S.A. were formed, but the system has now little in common with that of the U.S.A. system Few or no Ms. in the U.S.A. are created by charter. A municipal body in the U.S.A. is a corporation created by the state for state purposes as well as for local administration. This involves a certain distinction between Ms. created at the request of the people and those created for the convenience of state administration. Ms. come into being under general laws, and are not created by special act. See CITY.

Municipal Trade. Municipal trading is neither an old nor a new activity in social conditions, though in its present form and administration it may find no genuine parallel in the anct. or medieval communal life of the Eng. burgesses. So far as there was in the last century and later any conscious intellectual operation involved in its promotion as distinct from the unsystematic extension of municipal operations arising out of, and rendered necessary by, the ever-widening range of duties imposed by the legislature on local governing bodies in relation to public health, the maintenance of highways, housing, education, and welfare it might be taken to have been the expression

of the growing belief that it was incumbent on the social or civic conscience to supply the obvious omissions of individual enterprise. The real beginning of modern M.T. was in the middle of last century, when the Baths and Wash-houses Act, 1846, enabled local authorities to erect municipal baths and laundries, while later various Acts empowered them to control and manage harbours and docks, piers, quays, and gas concerns. According to Mill, it was conclusively estab., however, that gov. agency in any of the common operations of industry or commerce was never able to maintain itself in equal competition with individual agency where the latter had sufficient capital and enterprise. But M.T. nevertheless thrrove in spite of the arguments of political economists, especially when tn. or dist. councillors promised to secure the profits for the benefit of the general body of ratepayers. During the last quarter of the last century a number of local authorities obtained private Acts of Parliament enabling them to establish gasworks, but only in those places where there were no existing private companies; and later, they were given the right to purchase the undertakings of electric and tramway companies after the lapse of a fixed period of time. In 1890, Part III. of the Housing of the Working Classes Acts empowered local authorities to build dwellings for the working classes (see HOUSING); and urb. dist. councils have in more recent years availed themselves of these powers to an ever-increasing extent. At the present day the prin. municipal undertakings comprise waterworks, motor-bus services, and tramways (whether owned and worked by the municipality or owned by the municipality and worked by private companies), baths and wash-houses, burial-grounds, harbours, piers,

ferryes, working-class dwellings, and markets, most of these being known as 'public utilities.' The supply of gas and electricity were important trading undertakings but these have now been nationalised. Many councils have estab. milk depots to supply sterilised milk for children; many prov. tns. availed themselves of an Act authorising them to raise money for municipal telephones (all of which were subsequently sold to the post office); and the L.C.C. ran a steamboat service (see also under LONDON). The sum expended (otherwise than out of loans) by local authorities upon such undertakings as include the supply of gas, electricity, housing, water, tramways and light railways, harbours, docks, and piers, grew from about £49,000,000 in 1919 to £181,176,000 in 1935-36 and £201,012,000 in 1940-41. But it must be noted that the latter figure included trading activities not undertaken prior to 1919. Again, allowance must be made for the fact that the difference between the two totals, while representing a net increase in expenditure by local authorities was affected by the fact that many undertakings before 1919 belonged to commercial companies. The figures, however, serve adequately to show the great increase of the movement in recent years. An important point to be remembered in considering municipal trading undertakings is the distinction that while the provision of education, assistance, public health, etc., is a duty imposed by Parliament, M.T. facilities have, as a rule, been voluntarily undertaken by the local authorities. In 1927 Parliament gave local authorities power to borrow specified sums principally upon security of rates leviable by them or of funds under their control. The prin. methods of borrowing

Local expenditure and receipts for England and Wales in 1940-41 and in Scotland in 1938-39 were as follows:

	Expenditure		Receipts		
	England and Wales	Scotland	England and Wales	Scotland	
	£	£	£	£	
Electricity Supply	64,693,000	4,596,000	Electric Light Undertakings	64,929,000	4,595,000
Housing and Planning	18,005,000	7,887,000	Housing	27,567,000	4,383,000
Tramways, etc.	26,946,000	5,447,000	Tramways, etc.	27,038,000	5,367,000
Waterworks	25,431,000	2,479,000	Water Undertakings	23,677,000	894,000
Gasworks	20,830,000	4,819,000	Gas	20,869,000	4,640,000
Harbours, Docks, etc.	13,056,000	1,909,000	Harbours and Docks	11,688,000	1,920,000
Cemeteries	2,051,000	276,000	Cemeteries	1,416,000	112,000

In addition to this sum there was capital expenditure on housing of the working classes of £9,146,000 in England and Wales and of £12,003,000 in Scotland. During the nine months ended Dec 31, 1947, there was capital expenditure on housing of £124,815,890 and on gas £6,956,175. In 1947 the net trading debt was £212,204,788 and the net housing debt £242,812,552 of co. bors. alone.

are (1) mortgage deeds; (2) debentures, etc., under the Local Loans Act; (3) issue of stock; (4) application of redemption and sinking funds; (5) local bonds. At the present time it is customary for the lender to receive mortgage deeds in most cases. At the end of 1926 more than £285,000,000 had been borrowed for the purposes of municipal undertakings by local authorities. These sums were raised for the provision of airports, baths, cemeteries, electricity supply, gasworks, harbours, piers, docks, canals, light railways, markets, tramways, waterways, and other purposes. By the end of the financial year March 31, 1941, there were outstanding loans in England and Wales to the amount of £1,626,443,000, against which total £61,053,000 stood at the credit of sinking funds. The amount of outstanding loans and capitalised annuities in Scotland (1939) was £206,497,000, and in N. Ireland (1937) £21,525,000.

The nationalisation of coal, electricity, gas, and transport undertakings effected by the legislation of the Labour Gov. of 1945-50 transferred to state corporations their most profitable undertakings. The Local Government Act, 1948, has provided new fields of trading activity in authorising local authorities to undertake the provision of entertainments. See J. H. Warren, *Municipal Trading*, 1924; R. Wright and H. Hobhouse, *Local Government and Local Taxation*, 1926; H. Finer, *Municipal Trading*, 1941; Annual Reports of Ministry of Health and Ministry of Transport; Local Taxation Returns; and Statistical Statement of the U.S. Census Report.

Muniong Range, mts. of New S. Wales and Victoria, Australia, forming a part of the Great Dividing Chain. Mt. Kosciusko (7308 ft.) is the highest point in the Australian continent.

Munipore, see MANIPUR.

Muni River Settlements, see SPANISH GUINEA.

Munitions, Ministry of. Following the Fr. example the Brit. Gov., in June 1915, set up a M. of M. by Act of Parliament, with the object of coping with the requirements of the First World War. Besides the secretariat, the ministry had numerous correlated depts., namely, for munitions design, munitions supply, ordnance supply, shell manuf., mechanical transport supply, mechanical warfare supply, munitions inspections, munitions labour supply, munitions labour regulation, explosives supply, trench warfare supply, and munitions invention. During its existence the ministry took over many depts. of the War Office and employed a very great number of persons. Lloyd George was at one time minister of munitions. The ministry was abolished in 1920, when for winding up purposes it was succeeded by the Disposal Board (q.v.). There was no M. of M., as such, in the Second World War, the analogous dept. being designated Ministry of Supply, the chief depts. of which dealt with guns, explosives and chemical supplies, tanks, clothing and textiles, ammunition, raw materials, and machine tools.

Munkács, or *Mukacévo*, tn. of the Ukrainian S.S.R., 80 m. N.E. of Debreczen. It is situated on the Latorcza, and has manufs. of coarse cloth. Near by are noted alum and iron mines. Pop. 29,300.

Munkácsy, Mihály (1844-1900). Hungarian painter, whose real name was Lieb, was b. in Munkács. After the death of his parents he was sent by friends to the art school at Pesth. Later he went to Vienna and then to Munich, where he studied under Franz Adam. At Düsseldorf he painted 'The Last Days of a Condemned Prisoner,' which brought him fame. Soon after this he went to Paris, where he resided for many years, winning a number of honours and medals for his paintings. His chief paintings are 'Christ before Pilate,' 'The Crucifix,' 'Ecce Homo,' 'Arpad' (hung in the Hungarian parliament), 'The Apotheosis of the Renaissance' (Vienna), 'The Death of Mozart,' 'The Two Families,' 'Milton dictating *Paradise Lost* to his Daughters.' The first three paintings are now in Philadelphia. See lives by D. Malonyay, 1907; B. Lázár, 1925; and K. Lyka, 1926.

Munnings, Sir Alfred (b. 1878), Eng. painter, was educated at Framlingham, and studied art at Norwich and Paris. He first exhibited at the Royal Academy in 1898, specialising in turf and horse pictures. His 'Epsom Downs' is his best-known work. During the First World War he painted a series of war pictures for the Canadian Gov. A.R.A. in 1919. R.A. in 1925, he became president of the Royal Academy in 1944. An uncompromising critic of certain tendencies in modern art.

Munro, Hugh Andrew Johnstone (1819-1885), Scottish classical scholar and critic, b. at Elgin, and educated at Trinity College, Cambridge, becoming prof. of Lat. at the univ. He ed. (1860) and trans. (1864) the Vatican and Laurentian MSS. of Lucretius, and ed. Horace in 1868. He pub. *Criticisms and Elucidations of Catullus* (1878), and wrote many Gk. and Lat. vers.

Munro, Neil (1864-1930), Scottish author and journalist, b. at Inveraray. He started his journalistic career in Glasgow, and his first story was entitled *The Secret of Heather Ale* (1893). Three years later he pub. a collection of short stories, *The Lost Pibroch*. His novels are chiefly historical, and include *John Splendid* (1898); *Gilian the Dreamer* (1899); *Doom Castle and the Shoes of Fortune* (1901); *Children of Tempest* (1903); *The Daff Days* (1907); *Fancy Farm* (1910); *Ayrshire Idylls* (1913); *The New Road* (1914); and *Jawny Jock* (1918).

Munro, Sir Thomas (1761-1827), Scottish soldier and governor, b. and educated at Glasgow. He was appointed infantry cadet at Madras, 1779, served in the war against Hyder Ali, 1780-84, and was then promoted to lieutenant. In 1804 M. was promoted to lieutenant-colonel, and rendered great services to Gen. Wellesley (afterwards duke of Wellington) during the war with Scindiah and the rajah of Berar. He returned to India in 1814 on a commission to reorganise the judicial

and police depts. During the Mahratta war he was brigadier-general. On the termination of this war M., whose eyesight had suffered from exposure and work, returned to England, but soon after his arrival he was nominated to the governorship of Madras, and re-embarked for India in 1819. He held the post for seven years with most marked success. He strongly favoured the wider use of native agency and the education of natives to situations of responsibility in the public service, and indeed, was revered by the natives as the protector of their rights. See lives by G. R. Gleigs, 1830, and J. Bradshaw ('Rulers of India series'), 1894.

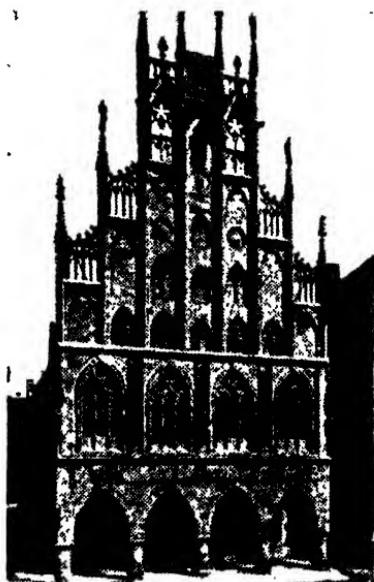
Munsey, Frank Andrew (1854-1925), Amer. publisher, b. May 21 at Mercer, Maine. After an elementary schooling he entered a country store, and later managed the W. Union Telegraph Office, Augusta, Maine. Arriving in New York, 1882, on borrowed capital he started the *Golden Argosy*, which developed into the *Argosy*, an all-story weekly. M. wrote some of the serials, e.g. *The Boy Broker* (1888). In 1889 he began *Munsey's Magazine*, and by 1907 was a very rich man, partly through his magazines, partly through his cash grocery stores. He also bought and sold newspapers, closing down many in the process. He owned the *New York Herald*, 1920-24, selling it to the proprietors of the *Tribune*. M. had no partners in his deals, and never married.

Münster, Sebastian (1489-1552), Ger. scholar, b. at Ingelheim. He entered a Franciscan convent, but becoming a convert to the opinions of Luther, threw off his monastic habit, and was appointed prof. of Heb. at Basle in 1529. The most important of M.'s works are *Grammatica chaldaica* (1527); *Dictionarium chaldaicum* (1527); *Dictionarium trilingue, in quo Lutinis vocibus, Graeca et Hebreica respondent* (1530); *Horologiographia* (1531); *Biblia hebraica* (2 vols., 1534-35 and 1546); *Organum Uranicum* (1536); *Cosmographia universalis* (1541); and *Rudimenta mathematica* (1551). See study by V. Hautzsch, 1898.

Munster, prov. in Eire, comprising the cos. of Cork, Waterford, Kerry, Limerick, Tipperary, and Clare. It was originally, i.e. before Henry II.'s reign, divided into two kingdoms, Desirond and Thomond, and the title and rank of king of M. were borne by the rulers of the respective kingdoms alternately. Area 9520 sq. m. Pop. (1946) 916,750.

Münster, cap. of Westphalia, Germany, is situated at the confluence of the Aa with the Dortmund-Ems canal, 65 m. N.E. of Düsseldorf. M., which is a bishopric, was, before the Second World War, one of the handsomest tns. of Westphalia, retaining numerous remains of medieval architecture, whose quaint picturesqueness was enhanced by the numerous trees and shady alleés by which the squares and streets were ornamented. The Gothic Rathaus (1313) was the scene of the signature of the treaty of Westphalia in 1648 (see WESTPHALIA, TREATY OF; and THIRTY YEARS WAR); paintings

of the ceremony by Gerhardt Terborch were to be found there. Little beyond the ground-floor arcade survived destruction, though the contents were safely evacuated. The cathedral, built between 1165 and 1265, though badly hit, and its W. bay destroyed, is capable of reconstruction. The Clemenskirche and the thirteenth-century Servatiuskirche were total losses. The fine towers of the Überwasserkirche, the Lambertikirche (1450), and the Ludgerikirche (1170) still remain, though the interiors are variously damaged. The patrician



THE RATHAUS (TOWN HALL), MÜNSTER, 1942

houses, built from the sixteenth to the eighteenth centuries, were almost wholly destroyed, and the Stadtweinhaus was a total loss. The Univ. has lost nearly all its buildings. Schlaunhaus, the archbishop's house, and the Schloss are in ruins. This widespread destruction has in fact destroyed the ancient character of a once remarkable city. The industrial products of M. are leather, woollen fabrics, thread, starch, and sugar, besides which there are carriage works, breweries, distilleries, and printing works. The trade is limited to the produce of the country, the princi. of which is the noted Westphalian ham and sausages. M. was heavily raided by the R.A.F. on July 5 and 6, 1941, over fifty great fire being caused on the second night, and again on Jan. 28 and May 13, 1942. Prior to the massed raid on Cologne, no Ger. tn. had suffered more severely than M. There were other raids on June 11, 1943, and March 23,

1945. Brit. troops entered M. on April 2, 1945, after the tn. had been heavily shelled to compel the Ger. commander to surrender. Pop. (pre-war) 143,740.

Munster Fusiliers, Royal, famous Irish regiment, descended from the Bengal Fusiliers raised in Charles II.'s reign, when they were part of the small detachment which was sent to the E. Indies to protect the factories of the E. India Company. Robert Clive was their first recorded colonel and Plassey was their first battle honour. Their familiar sobriquet 'Dirty Shirts' was 'conferred' on the regiment in allusion to their bravery at the siege of Bhurtpore (1805) where they discarded their tunics and fought in their shirts. The 104th Bengal Fusiliers, destined later to become the 2nd Battalion of the Munsters (the old 104th Foot), was embodied in 1839, and won its first great action at Chillianwallah. It was amalgamated with the 101st Foot as the R. M. F. The regiment also rendered great service in the Indian mutiny and in S. Africa. The 2nd Battalion was at Mons in the First World War, when they fought a brilliant rearguard action against a regiment of Uhlans. This battalion was almost annihilated at the Rue de Bois, near Armentières. In the subsequent winter campaign, the 1st Battalion (the old 101st Foot) was part of the 29th Div. in the Gallipoli campaign. Two of its companies were wiped out in trying to land on the 'V' beach, the third gained a footing after severe losses. The regiment was disbanded in 1922. See S. McCance, *The History of the Royal Munster Fusiliers*, 1928.

Münsterberg, Hugo (1863-1916), Ger.-Amer. psychologist, b. at Danzig. His work in psychology at Freiburg Univ. came to the notice of Wm. James, who invited him to Harvard as first director of its laboratory of psychology. President. Amer. Psychological Association, 1898. He pub. works in Ger. on psychology, and on the popular applications of psychology in Eng. When the First World War broke out, he was an untiring propagandist of Ger. culture. In this connection he pub. *The Peace and America* (1915), and even attempted by letter to influence the president. To intellectualism he opposed a theory of voluntaristic idealism, which regards the will as the essential principle. See J. H. Wigmore, *Münsterberg and the Psychology of Evidence*, 1909.

Münsterberg, tn. in Silesia, Germany, 37 m. S. of Breslau on the Ohlau; it has manufs. of clay products and breweries. Pop. 9000.

Muntasiq, liwa of Iraq, on the S. border of the country. The Hor al Hammur lake lies in the N.W. and the R. Euphrates crosses the liwa. The chief tn. is An Nasiriyah. The S. areas are largely desert. Pop. 281,647.

Munthe, Axel (1857-1949). Swedish medical practitioner and author, b. at Öskarshamn. He was educated at Uppsala Univ., and worked under Charcot at the Salpêtrière, but, disagreeing with the latter's theories on hypnotism, left him. For twelve years he was a gynaecologist

in Paris and in *The Story of San Michele*, written during periods of insomnia, he told how he adopted the term 'colitis' as a reassuring name for the imaginary ailments of his fashionable patients of the Faubourg Saint-Germain. In Rome, where he lived in Keats's house, he enjoyed an equally lucrative and fashionable practice and eventually made enough money to realise his ambition to build the villa, with bird sanctuary, of San Michele on the highest point of the is. of Capri. *The Story of San Michele* (pub. 1929), one of the most remarkable of 'best selling' vols. of memoirs of recent times, was originally written in Eng. and trans. into forty-four languages. He was for some years physician to Queen Victoria of Sweden.

Muntjac (*Cervulus muntjacae*), small deer which ranges throughout S.E. Asia. The hair is short and smooth, and bright rufus bay in colour, with a patch of white on the throat and beneath the tail. The buck's head has the V-shaped frontal bone greatly prolonged into two pedicles covered with skin and hair; short antlers grow from the tips. In the upper jaw are two sharp canine teeth which often extend below the lower lip.

Muntz's Metal, or **Yellow Metal**, is an alloy of three parts of copper and two parts of zinc. It is called after the name of its Birmingham inventor. Unlike brass it is malleable when hot, and can be more easily rolled than copper, which it has largely supplanted as material for sheathing wooden ships.

Münzer, or Müntzer, Thomas (1490-1525), leader of the Anabaptists (q.v.), b. at Stolberg, Harz Mts. A Hussite preacher (1520), he preached exaggerated Christian liberty, opposing civil government, religious rites, etc. (1521). He headed the Thuringian peasant revolt in 1524, but was defeated by the Elector John and Duke George of Saxony, the landgrave of Hesse, and the duke of Brunswick. He was beheaded at Mühlhausen along with Pfeiffer and a number of others. See G. Bloch, *Thomas Müntzer als Theologie der Revolution*, 1922, and L. G. Walter, *Thomas Müntzer et les luttes socialistes, 1927*.

Murad, see AMURATH.

Muradabad, see MORADABAD.

Muraena, or **Moray**, large eel-like fish without scales or pectoral fins, and distinguished from the true eels by the narrow slits into the pharynx. Ms. inhabit tropical and subtropical seas, and are very fierce and voracious, seizing their prey with formidable pointed teeth. *M. helena* is rich brown, marked with yellow spots. Most Ms. are richly coloured, and some attain a length of 10 ft., particularly *M. Macrurus* of the Indian seas. Altogether some eighty species are included in the family Mureidae.

Murakami, coast tn. of Iwondo, Japan. 45 m. from Niigata. Pop. 10,000.

Mural Decoration (Lat. *murus*, wall), art of adorning walls by means of surface painting in fresco, oils, or encaustic, by mosaic compositions, and by carving in wood, terracotta, stone, or marble. The term is also extended

to the decorative treatment of vaults and ceilings. In early Egyptian art interior walls were covered with figure and other designs, in low relief, or deeply incised, and were gaily coloured. Wonderful examples of M. D. of the Mycenaean Age have been discovered at Knossos. In Assyria walls were decorated with sculptured dadoes and coloured friezes, representing groups of figures. The sculptured friezes and metopes of ancient Greece, used as decorations for temples and public buildings, are of incomparable beauty. The early Romans employed three principal methods of M. D.: painting in fresco, mosaic painting, and marble incrustations. Remains of mural paintings have been preserved at Pompeii. In later centuries It. artists painted in oils on plaster. Cimabue and Giotto painted in fresco, leading the way in a form of M. D. which superseded all others. During the Middle Ages mural painting was used extensively in churches until the introduction of large areas of stained glass. In modern times the art of M. D. has declined, save in special cases such as saloons of great liners, restaurants, and schoolrooms. The chief forms of M. D. employed in domestic architecture are stamped leather and wall-paper. See also FRESCO; MOSAIC; TAPESTRY; WALL-PAPER. See G. White, *Practical Designing*, 1894; A. L. Baldry, *Modern Mural Decoration*, 1902; F. H. Jackson, *Mural Painting*, 1904; J. C. Wall, *Medieval Wall Paintings*, 1911; and H. Felibusch, *Mural Painting*, 1946.

Murano, tn. in the prov. and 14 m. N. of the city of Venice, Italy, on the is. of M. in the Venice Lagoon. It has the cathedral of San Donato (tenth century). It has long been the seat of the Venetian glass industry. The is. of M. is largely occupied by vineyards. Pop. 5800.

Murat, Joachim (1767-1815), king of Naples, son of an innkeeper, b. at La Bastide-Fortunière, near Cahors, France. He entered the Fr. Army, in which he served under Napoleon Bonaparte, to whom he became greatly attached, in Italy and Egypt, distinguishing himself at the battle of the Pyramids (1798). For his part in the 13th Vendémiaire he was made a lieutenant-colonel and first aide-de-camp to Napoleon, and after Aboukir was made a general of div. He dispersed the Council of Five Hundred at St. Cloud in 1799, and in the following year married Napoleon's youngest sister, Marie Arnouldine Caroline. He was made governor of the Cisalpine republic in 1801, and after taking part in the battles of Jena, Eylau, Austerlitz, etc., was made grand-duke of Berg and Cleves for his share in the last named. In the invasion of Spain in 1808 he commanded the Fr. armies and aspired to the Sp. throne vacated by Charles IV. Napoleon, however, gave him the Crown of Naples instead, and he was proclaimed king of the Two Sicilies (Naples and Sicily being often so named). He styled himself King Joachim-Napoleon and his rule was characterised by liberality and wise reforms, especially in abolishing feudal archaisms,

but he offended Napoleon by his sumptuous court life and by the number of marshals he created. In 1812, however, he commanded the cavalry of the grand army which invaded Russia, but after the battle of Leipzig he hastened back to his kingdom and, having broken with Napoleon, made overtures to Austria and Great Britain. When Napoleon escaped from Elba M. thought he could himself win all Italy and then treat with Napoleon as an equal, but he was checked at Ferrara and routed at Tolentino. After Napoleon had refused his proffered aid, he staked his all on an expedition to Calabria, against the Bourbons, but his popularity had vanished, and he was captured and shot at



JOACHIM MURAT

Pizz. See lives by J. Chavallon and G. Saint-Yves, 1903; H. Well, 1909-10; A. H. Atteridge, 1911; and A. de Turle, 1911; also L. Monnier, *Murat et le Congrès de Vienne*, 1937.

Muratori, Lodovico Antonio (1672-1750), noted It. scholar, antiquary, and historian, b. at Vignola, near Modena. In 1694 he became director of the Ambrosian College and Library at Milan, and while there pub. *Anecdota Graeca* and *Anecdota Latina*, previously unedited fragments. Recalled to Modena (1700), he became librarius and archivist to Duke Rinaldo I. His three chief works are *Rerum italicarum scriptores* (1723-38), dealing with the sources of medieval It. hist.; *Antiquitates Italicae medie aeti* (1738-1743), describing the constitution, customs, and thought of the Middle Ages; and *Annali d'Italia* (1744-49, first complete ed. 1753-56), a critical hist. of Italy from the birth of Christ down to 1750. *Dele Antichità Estensi* appeared in 1717-1740. His collected works were pub. 1767-80 and 1790-1810 and his letters, ed. by M. Cämpori, 1901-22. See lives by G. F. Moratori, 1756, and G. Bertoni, 1926.

Muraviev, Count Michael Nikolaevich (1845-1900), Russian diplomatist, b. in Poltava; studied superficially at Heidelberg, and entered the chancellery of

minister of foreign affairs. He held minor positions in Stuttgart, Berlin, secretary in Berlin and first secretary in Paris. In 1863 he incurred odium through his drastic measures in dealing with the Polish insurrection. He was appointed minister of foreign affairs in 1897. Owing to the Boxer rising in Manchuria (1900) his relations with the tsar (Nicholas II.) became difficult, and M. d. suddenly of apoplexy brought on, it is supposed, by an angry interview with him.

Murchison, Sir Roderick Impey (1792-1871), Brit. geologist, b. at Tarradale, Ross-shire, Scotland. He served with Wellesley in Galicia, 1808, and later under Sir John Moore, being present at the battle of Corunna. He left the army in 1816 and devoted himself to geology. He made a number of geological surveys of large parts of England and Scotland, and later travelled in France, Italy, the Tyrol, and Switzerland, studying the geological structure of the Alps. M.'s chief title to fame was the estab. of the Silurian system and his exposition of the Permian, Devonian, and Laurentian systems. Amongst other works he pub. *The Silurian System* (1833) and *The Geology of Russia in Europe and the Urals* (1845). See life by Sir A. Geikie, 1875.

Murchison Falls, gold-field, W. Australia, N. of Lake Austin, 21,600 sq. m. in area. Cue is the cap. of the dist., 540 m. N.N.E. of Perth. The M. R. forms the E. boundary of M. Pop. 3000.

Murchison Falls, in Uganda on the Victoria Nile about 20 m. from its exit from Lake Albert. At these falls there is a drop of the riv. of about 130 ft., the whole volume of the Nile passing through a rock-cleft only 19 ft. wide in the elevated scarp at its narrowest point and then thundering down in a series of splendid cascades. In the pool below are thousands of enormous fish and crocodiles, and at night, with the aid of a powerful lamp, the crocodiles may be watched feeding, their eyes glowing like red-hot coals. Sir Samuel Baker and his wife, taking canoes from near Lake Albert, travelled northwards and entering the Victoria Nile discovered the M. F. on April 3, 1864, but nearly a year of hardship and distress was to elapse before they once more reached their starting point, Gondokoro. Geologically, research has revealed two pluvial periods each including an oscillation towards drier conditions. About the time of the second of these periods an important earth movement occurred and brought about conditions such that the main rivs. can never again feed Lake Albert as they did in the earlier pluvial period, and it was then that the present outlet of Lake Victoria via Lake Kioga and the M. F. was estab. With the Ripon Falls (q.v.) and the rapids of the Semiliki R. the M. F. are one of the main barriers against the movement of fish, and from these obstacles result the two main divs. of the fish fauna of Uganda; for below the M. F. and the Semiliki rapids the fauna may be classified as of the Nile type, characterised by many genera and few species, while above these falls and in the lakes and their connected

rivs., there exist very few of the species inhabiting the lower waters and few genera are represented though some of them comprise numerous closely related species. The M. F. are reached by steamer from Butiaba. Their great attraction to the tourist is that the approach to them is by water through a game reserve, and on the journey over the 20-m. stretch of riv. between the exit of the Victoria Nile from Lake Albert and Fajao, the anchorage for the M. F., he is normally afforded the opportunity of observing from a position of security and comfort very considerable numbers of the larger animals in their natural surroundings—elephants, often in vast numbers, hippopotamuses, crocodiles, some of the lesser antelopes such as waterbuck, hartebeest, and Uganda kob, and, though less frequently, lion, black rhinoceroses, and buffaloes. Colobus monkeys and baboons. During the winter season the Kenya and Uganda Railways and Harbours organises special excursions. See H. B. Thomas and Robert Scott, *Uganda*, 1935.



MURCIA THE CATHEDRAL

Murcia: 1. Maritime prov. of Spain, forming part of the anc. Moorish kingdom of the same name between Andalusia and the kingdom of Valencia. The state is very mountainous in the S. and E., but there are fertile valleys rendered fruitful by irrigation, and the celebrated *huertas* (gardens), about 27 m. long and 3 m. broad, contain orange groves, mulberry and olive trees, vines, etc., and produce quantities of fruit and vegetables. There are large deposits of salt and minerals, especially lead and zinc. The principal manufs. are metals and silks. M. was conquered in 713 by the Moors, and became a dependency of Spain in 1210. Area 4369 sq. m. Pop. 772,486. 2. Walled city and episcopal see, cap. of above prov., 28 m. N.N.W. of Cartagena.

It is an important industrial centre, and has a univ. The R. Segura divides it into two portions, connected by a fine bridge. The prin. building is the cathedral, founded 1388. It has various manufs., including a saltpetre and gunpowder factory. Pop. 226,702.

Murder. The generally accepted definition of M. in Eng. law is that of Coke: 'When a person of sound memory and discretion unlawfully killeth any reasonable creature in being, and under the king's peace with malice aforethought, either express or implied' (see MALICE). Paraphrased this means: (1) That within limits children and idiots, or lunatics, cannot be guilty of M. But a lunatic who kills another person may be confined in Broadmoor or some other criminal lunatic asylum during the royal pleasure (see also INFANCY; CRIMINAL LAW). (2) That the mere killing of another by whatsoever means, whether by an act or omission likely to result in death, raises

a presumption of felonious homicide which the accused must rebut by showing some justification (see JUSTIFIABLE HOMICIDE) or excuse (as, for example, in self-defence). (3) That it is not M. to kill an infant in the womb, though such act of procuring abortion is punishable as a felony with penal servitude to the extent of life. But where a child born alive (in Scots law this is proved by any one who heard the child cry; in Eng. law by medical testimony that it breathed) afterwards dies by reason of drugs or wounds received while in the womb (*a fortiori* afterwards), those who administered such drugs or wounds are, according to the better opinion, guilty of M. (4) That it is not M. to kill an alien enemy actually participating in warfare against the state, but M. committed by a Brit. subject upon a foreigner (not an enemy) abroad is an extraditable crime, and the murderer can be punished by an Eng. court. (5) That the guilty state of mind essential to M.,

TABLE SHOWING THE NUMBER OF MURDERS KNOWN BY THE POLICE TO HAVE BEEN COMMITTED IN THE UNITED KINGDOM AND THE NUMBERS OF MURDERERS CONVICTED AND EXECUTED IN EACH YEAR BETWEEN 1922 AND 1944

Year	Number of Murders			Numbers for Trial						
	Murders known to Police	Murders of Infants under one year (included in previous column)	* Cleared up during year	Not tried		Guilty but Insane		Convicted	Sentenced to Death	Executed
				Total for Trial	No Prosecution	Insane on Arraignment	Acquitted			
1922	145	45	—	60	—	3	9	13	35	34
1923	150	51	—	58	1	14	10	12	21	21
1924	150	45	—	42	—	3	11	14	14	9
1925	160	35	—	81	2	8	16	24	31	30
1926	154	40	—	57	—	5	10	18	24	24
1927	143	43	—	50	—	6	6	13	25	16
1928	136	37	—	60	1	12	12	12	23	23
1929	131	28	—	50	—	7	8	19	15	7
1930	122	35	—	40	—	7	8	11	14	5
1931	138	27	—	57	1	8	13	17	18	9
1932	125	31	—	64	1	9	10	29	15	9
1933	141	39	—	53	1	5	10	18	19	10
1934	141	32	—	61	—	7	11	19	24	9
1935	120	19	—	52	—	6	11	15	20	10
1936	145	31	—	67	—	12	8	20	27	9
1937	114	26	98	44	—	14	5	11	14	7
1938	116	19	100	54	—	12	7	12	23	8
1939	157	21	143	64	—	11	14	11	28	9
1940	123	8	111	59	—	12	11	14	22	21
1941	146	11	133	64	—	10	12	18	21	15
1942	290	37	185	72	2	13	9	17	31	25
1943	174	34	151	75	—	12	10	24	29	27
†1944	166	35	147	48	—	10	6	11	21	13

* For the purpose of this column murders 'cleared up' refers to cases where a person has been charged with the offence or when the suspect has died, or where more than one murder has been committed by the same person.

† 1944 figures are provisional only.

though generally one of sedate and deliberate intention to kill, may be inferred from any wanton or cruel act against another likely to result in death (*see also MANSLAUGHTER; MALICE*). 'Constructive' M. means the killing of a person while engaged in committing another felony, e.g., if a burglar fearing capture rushes so violently past an inmate of the house as to cause his death, that will be M. however unintentional the killing. But in practice the death penalty is never inflicted in a clear case of merely 'constructive' M. There is no *crime passionnelle* in Eng. law, for no provocation, however great, will justify killing, though if there be no *express malice* (q.v.), the charge would be reduced to manslaughter.

Attempted suicide or self-murder is a felony punishable by imprisonment, but it is a commonplace of Eng. criminal law that if two people agree to commit suicide together and one survives, the survivor is guilty of M. Accessories before the fact to M. are equally guilty and punishable with the prin. offender; and an attempt to commit M. is punishable with penal servitude up to life. The punishment for M. is death, though in A.-S. times it was redeemable by payment of *Wergild*, or blood money, to the relatives of the murdered man. In *sots* of the United States M. is classified into degrees. For example, M. by poison or by any pre-meditated design is M. in the first degree, and punishable with death; all other kinds of M. are said to be in the second degree, and punishable with imprisonment.

Between 1900 and 1948 1178 persons were sentenced to death, of whom 617 (including 11 women) were executed. The capital sentence was commuted to penal servitude, or the person convicted was resited to Broadmoor, in 537 cases, of which 114 concerned women. There were two outstanding trends in this period: the decrease in the number of murders of wives, sweethearts, and mistresses (though this tendency has been reversed during recent years) and the increase during the last nine years in the number of murders of women in connection with sexual assault, and of men and women in connection with robbery.

Recent discussion on the question of the suspension or abolition of the death penalty (*see CRIMINAL LAW*) prompted the suggestion that Eng. law and practice should recognise degrees of M. A Home Office memorandum, submitted to the Royal Commission on Capital Punishment (Aug. 4, 1949), set out the prin. objections to dividing M. into two degrees. These were (1) the impossibility of framing a definition which did not include inappropriate cases; (2) there were not in fact two classes of Ms., but an infinite variety of offences which shaded off by degrees from the most atrocious to the most excusable. No simple formula could take account of the innumerable degrees of culpability, and no formula which failed to do so could claim to be just or to satisfy public opinion. The suggestion often made that deliberate pre-

meditation should be the criterion of M. in the first degree is open to the objection that premeditated Ms. have included some of those least deserving capital punishment, while there are also many bad Ms. where there is nothing to prove or disprove premeditation. An attempt to classify Ms. by enumerating those types of offence for which the death penalty might be considered appropriate, rather than by a general and comprehensive definition, would probably be more complicated, but it would be equally productive of anomalies and inconsistencies. A provision of this kind would mean that the prosecution would have to bear the responsibility of deciding whether to charge the accused with M. in the first or second degree, and whether to accept a plea of 'Guilty' on the lesser charge from a person charged with M. in the first degree. Cases might occur in which after a person had been charged with M. in the second degree, facts emerged during the trial to show that the case was one of M. in the first degree. Although the exercise of the prerogative of mercy would not, in theory, be affected in practice it would be difficult for the home secretary to recommend commutation in those cases in which the prisoner was found guilty of M. in the first degree and sentenced to death. If the decision on the degree of culpability rested with the individual judge, he would have to bear a heavy and difficult responsibility, and moreover there would be considerable disparity between decisions in different cases, because different judges are liable to have different standards, and because no judge has such facilities as are available to the home secretary for considering each new case in the light of comparable cases over a period of years. The law of Scotland on the working of the death penalty differs from that of England. When a prisoner charged with M. suffers from mental weakness and abnormality, though he is not insane, the charge may be reduced to one of culpable homicide. This plea of diminished responsibility has frequently been taken in recent years. The extent of mental abnormality to justify a reduction of the crime is, however, difficult to define. *See also under INSANITY.* *See* Russell, *On Crimes*; S. F. Harris, *Principles of the Criminal Law*, 1926; Edith Wharton, *Criminal Law* (in the U.S.A.); F. T. Jesse, *Murder and its Motives*, 1924; H. M. Walbrook, *Murders and Murder Trials*, 1932; and H. Simpson, *The Anatomy of Murder*, 1937.

Murdock, William (1754-1839). British engineer and inventor, b. at Auchinleck, Ayrshire. In 1792 he used coal gas as an illuminant in his own house, and ten years later it was used for lighting Soho. He also experimented on a high-pressure locomotive, and in 1784 made a small locomotive steam engine. He improved greatly on Watt's steam engine, and invented apparatus by which it was possible to use compressed air, devising the first oscillating steam engine.

Mure, Sir William (1594-1657). Scottish poet, b. at Rowallan in Ayrshire. He

became M.P. in Edinburgh in 1643, the following year being wounded at Marston Moor. He wrote a poetical trans. of Boyd's *Hecadombe Christiana* (1628); *The True Crucifix for True Catholickes* (1629), a version of the Psalms; *The History and Descent of the House of Rovallane* (pub. in 1825); and sev. miscellaneous poems.

Muret, or Muretus, Marc Antoine (1526-1585), Fr. humanist, b. at Muret, near Limoges. In 1563 he went to live in Rome, where he lectured and taught civil law till 1584, when he retired. He ed. Lat. authors and wrote *Orationes. Epistles* (1583), and *Fiarum Lectureum Libri XIX.* His collected works were ed. by C. H. Frotscher (1834-41).

Murfreesboro, city and co. seat of Rutherford co., Tennessee, U.S.A., 32 m. S.E. of Nashville. It lies in an agric. dist., and carries on a considerable trade in cotton, grain, live-stock, timber, etc. M. was settled in 1811, and incorporated in 1817. Near by was fought the battle of Stone R., in 1862. Pop. 8000.

Murger, Henri (1822-61), Fr. novelist, b. at Paris. His most popular work is his *Scènes de la vie de Bohème* (1848), portraying the irresponsible and happy-go-lucky life of artists and students in Paris. It is the basis of Puccini's opera, *La Bohème* (1898). He contributed to the *Rerue des deux mondes* and wrote a number of tales and dramas. Other works are *Scènes de la vie de jeunesse* (1850); *Claude et Marianne* (1851); *Le Pays Latin* (1852); *Adeline Protat* (1853); *Les Buveurs l'eau* (1855); *Le Sabot rouge* (1860); *Madame Olympie* (1852); and other prose tales, and a collection of poems entitled *Les Nuits d'hiver* (1864). Andrew Lang trans. sev. of his songs in *Ballads and Lyrics of Old France*, 1872. See Lives by A. Delyau, 1866; R. d'Héricault, 1896; and G. Montorgueil, 1929.

Murghab: 1. Riv. of Central Asia, rising in Afghanistan and flowing W. and N.W. into Russian Turkestan through the oasis of Mero. It is lost in the sands 150 m. below Mero, after a course of about 370 m. 2. Riv. rising in the Pamirs, W. Asia, at an altitude of 13,720 ft., and flowing N.E., N.W., and W. to its junction with the Panj, or S. head-stream of the Oxus, at Wakhan. Length 260 m.

Muri: 1. Area of the emirate of Adamawa, N. Nigeria, traversed by the Benue R. Products: oil palm, rice, and citrus fruits. Pop. about 200,000. 2. Tn. of N. Nigeria, W. Africa, in Sokoto, 15 m. from the r. b. of the Benue, 300 m. E.N.E. of Lokoja.

Murillo, Bartolomé Estéban (1617-82), Sp. painter, was b. at Seville, and after receiving some education, was placed with his relative, Juan del Castillo, to study painting. Having saved a little money, which he made by hawking pictures at fairs and by painting religious pictures for exportation to S. America, he went to Madrid in 1641, being then in his twenty-fourth year, was favourably noticed by Velasquez, who treated him with the greatest kindness, and through his influence was enabled to study the master-

pieces of It. and Flem. art in the royal collections. In 1645 he determined to return to Seville, after an absence of three years, though advised to proceed to Rome by Velasquez, who offered him letters from the king. After settling in Seville he received numerous important commissions, including one from the friars of the Franciscan convent to paint a series of pictures for their cloister, and was soon acknowledged as the head of the school there in succession to Pacheco. In 1648 M. married a lady of fortune; he now maintained a handsome estab., and his house was the resort of people of taste and fashion. The Academy of Seville was



MURILLO
Engraving after a self-portrait.

founded by him in 1660, but he filled the office of president only during the first year. In early life he painted many pictures illustrative of humble life; in these the manner was less refined than that of his later pictures, which are mostly religious pieces. Amongst various altarpieces which he painted for the churches and convents in Madrid, Seville, Cordova, Cadiz, and Granada, is one representing the 'Marriage of St. Catherine,' and it was on the eve of his finishing this work that he met with an accident in the scaffolding, wounding himself so badly that he continued to feel the effects until his death at Seville in April 1682. He was buried in the church of Santa Cruz. In the Louvre, and in England, there are about forty of his works. The most celebrated of M.'s pictures are 'Moses striking the Rock,' 'Christ feeding the Five Thousand,' 'St. Anthony of Padua,' 'The Prodigal's Return,' and 'St. Elizabeth of Hungary' (Prado). The

picture M. preferred to all his other works was that of 'St. Thomas de Villanueva distributing Alms to the Sick and Poor.' His *chef-d'œuvre* is the 'Immediate Conception,' which was purchased for the Louvre at the sale of Marshal Soult's collection in 1852 for £26,612. (There are fifteen examples of the 'Immaculate Conception,' in the Louvre, Seville Museum, Prado, etc.) Sir David Wilkie, who greatly admired and carefully studied the Sp. school, remarked in reference to it: 'Velasquez and Murillo are preferred, and preferred with reason, to all the others, as the most original and characteristic of their school. These two great painters are remarkable for having lived in the same time, in the same school, painted for the same people, and of the same age, and yet to have formed two styles so different and opposite that the most untaught can scarcely mistake them. Murillo being all softness, while Velasquez is all sparkle and vivacity.' M. is known especially as a master of colour contrast. In the National Gallery, London, are 'A Spanish Peasant,' 'The Holy Family,' 'St. John and the Lamb,' and 'A Boy Drinking.' Other works include 'Founding of Santa Maria Maggiore' (four pictures in Santa Maria Blanca, Seville), 'La Purisima' (Seville Cathedral), 'St. John of God attending the Sick' and 'Miracle of the Loaves and Fishes' (Church of St. George, Seville), 'Adoration of the Shepherds' (Prado), 'Birth of the Virgin' (Louvre), and 'St. John at Patmos' (Metropolitan Museum of New York). See monographs by H. Knackfuss, 1896, 1923; P. Lafond, 1907; S. Montoto, 1923; and A. Muñoz, 1943. See also A. Calvert, *Murillo: Biography and Appreciation*, 1907; A. G. Hill, *Christian Art in Spain*, 1913; and C. R. Post, *A History of Spanish Painting*, 1933.

Murins, kind of bat divided into two species, *Murinae* and *Minioptera*. The former are very large with a nose like a fox, big ears, and a wing span of us much as 16 in. The *Minioptera* are small creatures weighing barely one-third of an ounce; the nose is flattened like a pug's, and the wings are tapered, enabling them to fly with amazing rapidity.

Murmansk: 1. Formerly *Ekaterininsk*, port and naval station on the Kola Inlet of the M. coast of the Barents Sea, cap. of the M. Region of the R.S.F.S.R. Its development since the 1917 revolution has been phenomenally rapid and the increase in pop. from 10,000 in 1917 to 117,051 to-day was due largely to the construction of the railways joining it with Leningrad, and to the fact that it is the only ice-free port all the year round, a fact of great strategic importance to the allied nations in the Second World War. Its industries are mostly related to its fisheries and include the production of cod-liver oil and shagreen. In 1918-19 an allied force operated from M. as a base against the Bolsheviks. On Oct. 23, 1939, the American-owned ship *City of Flint* arrived at M. with a Ger. prize crew. She was sailing from New York to Manchester when the Ger. battleship *Deutschland* put the prize crew on board (see further under

NAVAL OPERATIONS IN SECOND WORLD WAR). The first Ger. bombers over M. appeared on July 3, 1941. Russian bombers attacked the Finnish-Ger. forces near M. in Nov. 1941. The Oers., however, never succeeded in taking the tn. 2. Region of the R.S.F.S.R., with an area of 53,630 sq. m., bordering on Finland and formed by the Kola peninsula. Its coasts are important fishing areas, especially for cod, and the region round Lake Imandra has been developed as an industrial area. Copper, nickel, and iron are found near the lake, and mica in the E. of the peninsula. Power is supplied by hydro-electric stations utilising the rives flowing from the Finnish border to the sea. Near M. tn. the bogs have been drained and produce a large supply of vegetables. Pop. 291,000.

Murner, Thomas (1475-1536), German satirist and opponent of the Reformation. He was b. at Oberchuhheim in Alsace. In 1505 he was made poet laureate by Maximilian, and in 1513 became guardian of the Franciscan monastery at Strasburg. His satirical works, directed against the Reformation and Luther, include *Die Narrenbeschreibung* (1512); *Die Gauchmatt* (1519); and *Von dem grossen lutherischen Narren* (1522). See W. Kuwerau, *Murner und die deutsche Reformation*, 1891, and *Murner und die Kirche des Mittelalters*, 1890, and W. Pfeiffer-Bell, *Thomas Murner im Schweizer Glaubenskampf*, 1939.

Muro Lucano, tn. in the prov. and 20 m. N.W. of the tn. of Potenza, Italy. Pop. 8,500.

Murom, tn. in the Gorky region of the R.S.F.S.R. on the l. b. of the Oka R., 81 m. S.E. of Vladimir; has an old cathedral. There are iron-ore mines near by, and the tn. trades in timber, cereals, metals, salt, sugar, and tea. Pop. 23,000.

Muroran, port and naval station in the prov. of Iburi, Yezo, Japan; has large steel works, and exports timber and coal. Pop. c. 12,000.

Muros, com. in the prov. of Cotunua, Spain, 29 m. W.S.W. of Santiago. Pop. 9000.

Murphy, Arthur (1727-1805), British actor and playwright, b. near Elphin, Roscommon. In 1751 he made his débüt as an actor in *Othello* at Covent Garden. He wrote numerous farces and dramas, amongst them *The Apprentice* (1756); *All in the Wrong* (1761); *What we Must all Come to* (1761), played in 1776 as *Three Weeks after Marriage; Know Your Own Mind* (1778), etc.; some satires, and a tragedy, *Tartuffe* (1793).

Murphysboro, city and co. seat of Jackson co., Illinois, U.S.A., 87 m. S.E. of St. Louis by rail. Coal and iron are mined. Pop. 9000.

Murrain, foot-and-mouth disease (q.v.).

Murray, Sir David (1849-1933), Scottish artist, b. in Glasgow, gave up a commercial career to study painting. Elected A.R.A. in 1891 and R.A. in 1903, in 1917 he was made president of the Royal Institution of Painters in Water Colours. His pictures are mostly realistic landscapes and among the best are 'In the

Country of Constable,' 'River Road,' 'Marigolds,' 'Young Wheat,' 'Gorse,' and 'Hampshire.' Two of them are in the Tate Gallery.

Murray, David Christie (1847-1907), Eng. novelist, b. at W. Bromwich, Staffordshire. In 1876 he was special correspondent for *The Times* during the Russo-Turkish war. He wrote numerous novels, the best of which are *Joseph's Coat* (1881); *One Traveller Returns* (with H. Herman) (1887); *Bob Martin's Little Girl* (1892); *In Direst Peril* (1894); and *Verona's Father* (1903).

Murray, George Gilbert Aimé (b. 1866), Eng. scholar, poet, and author, b. at Sydney, New S. Wales, son of Sir Terence Aubrey M., president of the Legislative Council, New S. Wales. Educated at Merchant Taylors' School and St. John's College, Oxford. A fellow of New College, Oxford, in 1889 he became prof. of Gk. at Glasgow Univ., and from 1908 to 1936 was regius prof. of Gk. at Oxford. In 1889 he married Lady Mary Howard, daughter of the ninth earl of Carlisle. He became prot. of poetry at Harvard Univ. in 1926, and from 1914 was a trustee of the Brit. Museum. From 1923 to 1938 he was chairman of the League of Nations Union (co-president from 1938), and president of the International Committee of Intellectual Cooperation from 1928. He pub. a *History of Ancient Greek Literature* (1897). His verse trans. or free renderings of Gk. plays, e.g. of Euripides: *Hippolytus*, *Trojan Women*, *Electra*, *Medea*, *Iphigenia in Tauris*; of Sophocles: *Oedipus Rex* (1902-13); and of Aeschylus: *Agamemnon*, *Eumenides*, and *Persians*, are of the highest quality and reintroduced Gk. drama to the stage, becoming known during the Vedrenne-Barker management at the Court Theatre, 1904-7, and new ones appear occasionally. O.M., 1941. Of his other publs. may be mentioned, *The Rise of the Greek Epic* (1907, 1911, and 1924); *The Origin of Tragedy* (1912); *Five Stages of Greek Religion* (1913, 1925); *Stoic Philosophy* (1915); *Faith, War and Policy* (1918); *Problem of Foreign Policy* (1921); *The Ordeal of this Generation* (1929); *Aristophanes* (1933); *Liberality and Civilisation* (1938); *Aeschylus, Creator of Tragedy* (1940); *Stoic Christian and Humanist* (1940); and *From the League of U.N.* (1948).

Murray, Sir Hubert (1861-1940), Brit. administrator, b. at Sydney, New S. Wales, son of Sir Terence Aubrey M., president of the Legislative Council, New S. Wales, and a brother of Gilbert M. He was educated at Sydney Grammar School, Univ. College, London, and Oxford Univ., and served with the Australian Bush Rifles in the S. African war. After holding a Crown prosecutorialship (he had been called to the Bar in 1886) at the New S. Wales Bar, he accepted the appointment of lieutenant-governor of Papua, and in his long tenure of office made the administration of Papua a model. He developed in his staff an extraordinary power to understand the outlook and minds of the natives and a unique way of dealing

with them. Some account of his methods may be found in his various writings, including *Review of the Australian Administration in Papua* (1907-20); *Papua or British New Guinea* (1912); and *Papua To-day* (1925). See T. G. Hides, *Papuan Wonderland*, 1936, and L. Lett, *The Papuan Achievement*, 1943 (an account of his thirty-two years' administration).

Murray, Sir James Augustus Henry (1837-1913), Brit. philologist and lexicographer, b. at Denholm, near Hawick, Roxburghshire. He graduated at London and Oxford, and received the degree of LL.D. (Edin.) in 1874. He commenced teaching at Hawick Grammar School in 1855; became master at Mill Hill School, 1870; assistant examiner in Eng. to the univ. of London, 1875-79; and in 1885 went to Oxford. For many years he was engaged in editing the *New Oxford English Dictionary* (pub. 1884-1933), of which he was the chief creator, though his editorial responsibility covered only A-D, H K. O. P, and T. In 1878 he was appointed president of the Philological Society, London, for which he wrote various papers. He was also the author of articles on the *History and Language of the Border Counties*, and *The Dialect of the Southern Counties of Scotland*. See memoir by H. Bradley in *Proceedings of the British Academy* (vol. viii. 1919); the life by C. T. Onions in the *Dictionary of National Biography*; and S. Baldwin, *The Oxford English Dictionary, 1884-1928*. An Address, 1928.

Murray, or Moray, James Stuart, Earl of, see MORAY.



JOHN MURRAY (1778-1843)

Murray, John, name of sev. generations of Eng. publishers, and one that will long remain associated with many a classic writer of Eng. literature. John M. (1745-93), the founder, b. in Edinburgh, first served as an officer in the Royal Marines. In 1768 he purchased the bookselling business of Wm. Sandby, and thenceforth became a bookseller and publisher at '32 Fleet Street.' His most notable publs. were Mitford's *History of*

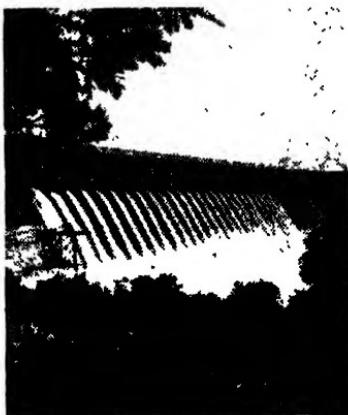
Greece (1784–1810), J. and W. Langhorne's *Plutarch* (1770), and the first part of Isaac D'Israeli's *Curiosities of Literature* (1791–1823); and he also started the monthly *English Review*. At his death he was succeeded in due time by his son John M. (1778–1843), who was left an orphan of fifteen at his father's death. The second John M. began by himself editing many medical and other works, and founded in 1809, as a counterpart to the *Edinburgh Review*, the renowned *Quarterly Review*. The enormous financial success of the *Quarterly* enabled M. to extend his activities. His premises at Albemarle Street became the resort of *literateurs*, including Walter Scott, of whose *Marmion* and some other works M. was part publisher. Southey, Byron, Jane Austen, Borrow, Crabbe, Moore, Campbell, Washington Irving, and the critic Gifford. In deference to the wishes of Byron's family he burned his memoirs of which he (M.) became possessor on B.'s death. In collaboration with Scott, Southey, and others, he pub. his Family Library of 80 vols., a work which is further notable by reason that M. lowered the conventional price to reach a wider circle—a movement which was developed in later years by Dent's Everyman's Library. Another large series was M.'s Guide Books. John M. (1808–92) succeeded his father and himself wrote numerous vols. of the Handbooks for Travellers, travelling extensively on the Continent for the purpose. The works of Grote and Darwin, as also those of Hallam, Dean Stanley, Livingstone, Gladstone, and Lyell, J. Campbell's *Lives of the Chancellors*, 1845, and Wm. Smith's classical dictionaries were pub. by him. He ed. Gibbon's autobiography and Byron's Correspondence. The fourth John succeeded in 1892 and for sixteen years had his brother Hallam as partner. An outstanding event of his time was the pub. of the *Letters of Queen Victoria*. He also pub. many notable works of hist., biography, travel, fiction, etc., and in 1917 absorbed the well-known firm of Smith, Elder & Company. He was made a K.C.V.O. in 1926 and d. in 1928. He was succeeded by John the fifth (b. 1884), under whom the *Letters of Queen Victoria* were completed and Axel Munthe's famous *San Michele* pub. The firm still continues in the historic premises in Albemarle Street to carry on the traditions of sound literature. J. M. (fifth) was awarded a D.S.O. and bar in the First World War, and was made a K.C.V.O. in 1932. See S. Smiles, *A Publisher and his Friends: Memoir and Correspondence of John Murray*, 1891, 1911; John Murray (fourth), *John Murray III, 1808–92*, 1919; and George Paston (E. M. Symonds), *At John Murray's: Records of a Literary Circle, 1843–1892*, 1932.

Murray, Sir John (1841–1914), Canadian naturalist and geographer, b. at Coburg, Ontario, and educated in Ontario, the High School, Stirling, Scotland, and at Edinburgh Univ. He was one of the naturalists who made the famous voyage in the *Challenger*, and was appointed editor

of the reports of the expedition. He also took part in the explorations in the *Triton* and *Knight Errant* to the Faroe Channel. Besides the above reports he was one of the authors of *The Narrative of the Cruise of the "Challenger"* (1866); of *A Report on Deep-sea Deposits* (1891); and of *A Report on the Survey of the Lochs of Scotland* (1910). He also wrote numerous articles on geographical and marine subjects.

Murray, Lindley (1745–1826), Anglo-Amer. grammarian, b. at Swatara, Pennsylvania. He was called to the Bar in 1765. In 1784 he settled in England and devoted himself to literature. His first book was *Power of Religion on the Mind* (1787). Later he wrote *English Grammar* (1795, and 200 eds. before 1850), long a standard work and his chief claim to a place in literature. These were followed by various works, such as Eng. readers, etc. See *Memoirs in Letters written by Himself*, 1826.

Murray, William, see **MANSFIELD, EARL OF**.



Australian News and Information Bureau

MURRAY RIVER
under the Concrete Wall.

Murray, or Hume, prin. riv. of Australia, rising in the Australian Alps and flowing W. to the sea through the shallow Lake Alexandrina. For the greater part of its course it forms the boundary between New S. Wales and Victoria. In conjunction with the Darling it drains almost the entire S.E. quarter of the continent. Its total length is about 1500 m. Owing to sandbars at its mouth it is inaccessible for large vessels but navigable for small steamers. Its chief trib. are the Murrumbidgee, Lachlan, and Darling. The water of the M. is used for irrigation purposes, being dammed *¹ the Hume reservoir where the Mitta Mitta joins it, so that it is available in the dry season. The Hume Reservoir stores 1,250,000 acre feet of water which runs off a catchment area of

about 6000 sq. m. of mountainous country on the border of Victoria and New S. Wales. It is composed of an earthen embankment 411 ft. long and a massive concrete wall, forming the spillway and outlet works, across the riv. for 1042 ft. on the New S. Wales side. On the Victorian side, an earthen embankment 3827 ft. long, brings the total length to one mile. The reservoir forms a vast inland lake of 33,000 ac.—three times the size of Sydney Harbour. The large volume of water stored in it ensures an adequate flow of water in the irrigated areas in the lower reaches of the M. R. In 1919 the govs. of New S. Wales and Victoria agreed on a scheme for the diversion of the headwaters of the Snowy R. (q.v.) across the Australian Alps into the Upper M. and Tumut Rs., in connection with a vast hydro-electric irrigation project estimated to cost £A170,000,000. The scheme, which will take many years to complete, will, it is estimated, yield 1,300,000 kilowatts, about one-half more than the current total consumption of electricity in the two states. It is expected that in about eight years the water available for irrigation in the Murray-Murrumbidgee valley will be twice the volume now available and that soon afterwards large-scale generation of power will begin. See J. M. Holmes, *The Murray Valley*, 1948.

Murray Bay, or Malbaie, watering-place and bay of Charlevoix co., Quebec, Canada, on the Lower St. Lawrence R. Pop. 4300.

Murray Bridge, tn. of S. Australia. On the R. Murray, 50 m. S.E. of Adelaide, on the Adelaide-Melbourne road and railway line. Centre of an extensive dairy-farming industry, its other pursuits are agriculture and pastoral. It is a popular tourist resort. Pop. 4000.

Murraysburg, vil. and div. of Cape of Good Hope, S. Africa. The vil. is 50 m. N.W. of Graaf-Reinet. Pop. (vill.) (white) 1200, (others) 3700.

Murree, or **Marri**, hill station and sanatorium of Pakistan, about 10 m. N.E. of Rawal Pindi (altitude 7520 ft.). Pop. (winter) 2000, (summer) 20,000.

Mürren, vil. of the Bernese Oberland, Switzerland, 3 m. S.W. of Lauterbrunnen. It affords a fine view of the Jungfrau. Pop. 1600.

Murrhine, or **Myrrhine**, **Vases**, celebrated vessels of antiquity, brought from Asia to Rome by Pompey, after his victory over Mithridates.

Murrumbidgee, riv. of New S. Wales, rising on the N.E. of the Australian Alps, and flowing 1330 m. westwards to join the Murray, 96 m. S.E. of the mouth of the Darling. It is navigable for 500 m. during the wet season.

Murry, John Middleton (b. 1889), Brit. writer, b. in Peckham, London. He was educated at Christ's Hospital and Brasenose College, Oxford, was on the staff of the *Westminster Gazette*, 1912-13, being art critic 1913-14. During the First World War he served in the political intelligence div. of the War Office, Editor of the *Athenaeum*, 1919-21, and of the *Adelphi*, 1923-30. He became Clark

lecturer at Cambridge Univ. in 1924. He ed. *Peace News* from 1940, and, in this connection, wrote *The Necessity of Pacifism* (1937). His writings largely consist of literary criticism and criticism of existing social institutions. Among his many works are *Aspects of Literature* (collected essays in the *Athenaeum*, 1920); *The Things we are* (1922); *Things to come* (1928); *God* (1929); *Son of Woman* (on D. H. Lawrence, 1931); *The Necessity of Communism* (1932); *Between Two Worlds* (autobiographical, 1934); *Shakespeare* (1936); *The Defence of Democracy* (1939); *The Betrayal of Christ by the Churches* (1940); *Christocracy* (1942); *Adam and Eve* (1944); *The Free Society* (1947). Also a collection of Poems (1919). He collaborated with Ruth E. Mantz in a biography of his wife, Katherine Mansfield (q.v.) (1933). He rejects criticism which looks that reference to life as a whole which, in his later years, he has come to regard as essential to all criticism, and considers that 'the function of true criticism is to establish a definite hierarchy among the great artists of the past, as well as to test the production of the present; by the combination of these activities it assists the organic unity of all art' (*Aspects of Literature*). It is said that the character of Denis Burlap in Aldous Huxley's *Point Counterpoint* is founded on M.'s personality. See study by R. Heppenstall, 1934.

Murshidabad, city and dist. of Bengal, India. The city lies 115 m. N. of Calcutta, and extends along both sides of the sacred R. Bhagirathi. During most of the eighteenth century it was the Muslim cap. of Bengal, and was a flourishing and an important city. It contains the palace of the nawab, a handsome structure. The industries include the manuf. of silk and other fabrics, embroidery, and articles of carved ivory, gold, silver, etc. The entire dist. covers an area of 2143 sq. m., and the pop. numbers about 1,500,000. Pop. of tn. 20,000.

Mursia, see ESZER.

Murten, see MORAT.

Murtoza, fishing centre of Aveiro, Portugal, 30 m. S. of Oporto. Pop. 10,000.

Murviedro, see SAGUERO.

Mus, **Mush**, or **Moush**, prov. (il) of Turkey, 55 m. W. of Van Goli Lake, and largely peopled by Armenians. Pop. 82,518.

Musa, Abu Abdallah Mohammed Ben, Arabian mathematician, the first of his countrymen to write on the science of algebra, and to whom Europe is indebted for its introduction.

Musa, Antonius, Rom. physician and a brother of Euphorbus. Is said to have been the first to recommend the use of cold baths, and treated the Emperor Augustus by this means. Was also of a literary bent and acquainted with Virgil and Horace.

Musa, Ibn Nosseyr, or Nosair (A.D. 640-715), Arab conqueror of N. Africa in 699-709. In 712 he formed an alliance with Count Julian and crossed to Spain, taking sev. important ins., amongst them Seville.

On his return he fell under the displeasure of the caliph of Damascus, who exiled him.

Musæus, Gk. grammarian who fl. about the fifth century A.D. He wrote an erotic poem describing the loves of Hero and Leander, which has been trans. into Eng. more than once, notably by Christopher Marlowe (Dillthey's ed., Bonn, 1874), and into Ger. by A. Zimmermann (1914).

Musæus, Johann Karl August (1735-1787), Ger. novelist, b. at Jena. His first work, entitled *Grandison der Zweite*, was pub. in 1762 and rewritten about twenty years later under the title of *Der deutsche Grandison*, its object being to satirise the Eng. novelist Richardson's hero. His most important work was *Volkssüchsen der Deutschen*, a series of satirical tales (1782-86). See M. Müller, *J. K. A. Musæus*, 1867; also Carlyle's trans. and biographical notices.

Musca (Lat. the fly), constellation situated E. of Chamaeleon and S. of the Southern Cross, also sometimes known under the name of Apis (the bee), and formerly used to designate a constellation N. of Aries. It contains nine stars, visible to the naked eye, one of the third and three of the fourth magnitude.

Muscardine, or Silkworm Rot, disease which causes much loss among silkworms. It is caused by a fungus, many allied species of which are parasites on Lepidoptera, both in the caterpillars and the perfect insects.

Muscat, tn. and seaport on the S.E. coast of Arabia, cap. of the sultanate of Muscat and Oman. It is under Brit. political influence. The climate is hot and unhealthy. Dates are the prin. export. M. was taken by the Portuguese in 1508 and remained under their rule till 1650, when they were finally expelled. M. was once an important, prosperous tn., but has been falling into decay for many years and most of its former trade now goes to the sister port of Matrah, which is the starting point of the trade route to the interior, but M. still remains the seat of government. Pop. about 4'000.

Muscated, **Muscadelle**, **Muscadel**, or **Muscadine** (It. *moscato*, musk), white wine produced in Languedoc, France, both strong and sweet. The name is generally applied, however, to most Fr. and It. wines made from the muscadine grape, either of the red or white variety.

Muscatine, city of Iowa, U.S.A., on the r. b. of the Mississippi. Manuf's. include pearl buttons, terra-cotta, pottery, etc. Pop. 18,000.

Muscle, structure of the body capable of causing motion by the contraction of its fibres. Muscular tissue consists of elongated cells or fibres. The fibres making up some of the Ms. consist of protoplasmic material with transverse stripes; these are called striped or striated fibres. Others possess no transverse markings, and are therefore known as non-striated or plain muscular fibres. Every muscular fibre has the property of contracting, that is, on the receipt of a certain stimulus a chemical change is brought about, resulting in a change in

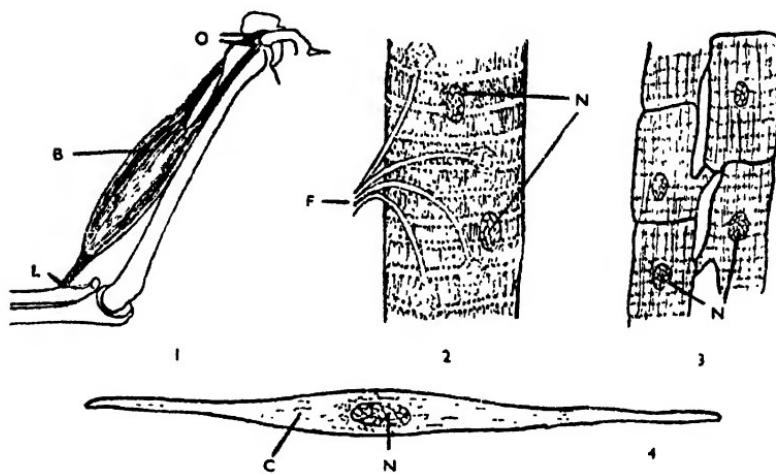
the elastic tension of the cell. An increase of tension occurs in the points of attachment of the cell to neighbouring tissues, which ordinarily move under the strain, so that the length of the fibre decreases, while its diameter becomes proportionately bigger. In some Ms. this contraction is voluntary; that is, it is the result of an act of will. This modification of consciousness is accompanied by a certain mode of activity in some of the cells of the large brain, or cerebrum. By this means an impulse is communicated to the nerve-fibres supplying the Ms. and is conveyed to the M. by end-plates or expansions of the nerve-fibres situated on the surface of the muscular fibres. Other Ms. are not under the control of the will. Such are the Ms. causing the motion of the stomach and other parts of the alimentary canal. They are called involuntary Ms., and are made up of non-striated fibres, except the cardiac M., which resembles voluntary Ms. in being striated. It is, however, not always possible to classify Ms. as voluntary and involuntary, for some of them, such as those of the tongue, larynx, and eyeballs of the Vertebrata, and certain Ms. of Arthropoda, are intermediate in type. The capacity of a M. for responding to a stimulus is termed its excitability. In cardiac M. the extent of contraction does not depend upon the intensity of the stimulus, but in Ms. attached to the bones a relation is maintained between contraction and stimulus. If, however, a M. has been repeatedly contracted without much intermission, a stimulus does not evoke the usual extent of contraction. This condition is called muscular fatigue, and further evidence of it is afforded by the increasingly longer periods of relaxation. Eventually the M. will fail to respond at all to the stimulus. Muscular fatigue is due to the formation of lactic acid from the glycogen in the M. cells. This glycogen is produced by the action of insulin (q.v.) on the sugar dissolved in the blood, and, apparently by an internal rearrangement of the molecule, glycogen is converted into lactic acid. This change accompanies the contraction of the M., and heat is produced during the process. A young athlete, running as fast as he can, produces about four grammes of lactic acid per sec.

During relaxation some of the protein in the M. cell combines with and neutralises the lactic acid, and recovery from fatigue is effected by oxidation of the product. This process results in the re-formation of protein, the conversion of some of the lactic acid into glycogen, and the complete oxidation of the remainder with the elimination of carbon dioxide and the production of heat.

When exercise is moderate the amount of lactic acid in the blood reaches its maximum after a few minutes and is quickly removed by the increase of the oxygen supply by deep and rapid breathing. If exercise is very strenuous the lactic acid increases until there are symptoms of distress, and eventually a type of *rigor mortis* may be caused. The fleshy part of a M. is usually attached at each

end to bands, or tendons, of white fibrous tissue, which is itself non-contractile, but in *Vertebrata* serves to join the M. to some bone. The attachment which is more fixed is called the origin; that which is more movable is called the insertion. Thus the biceps has two origins, in the coracoid process and the glenoid cavity; its insertion is in the tuberosity of the radius, or the outer bone of the forearm. Every M. is supplied with blood-vessels, and lymphatics to carry the substances for repair of tissue, for the combustion which liberates the energy resulting in contraction, and for the removal of

Muselier, Émile Henri (b. 1882), Fr. admiral, b. in Marseilles and educated at the Brest naval school. He was a corvette captain in 1918 and, after the First World War, became frigate captain (1922), rear-admiral (1933), and vice-admiral (1939). Among his commands before the Second World War were those of the defences of Cherbourg and of the second cruiser div. in the Mediterranean; in 1938 he was appointed admiral commanding the navy and defences of Marseilles. On the collapse of France in 1940 M. joined Gen. de Gaulle (July 1940), who made him commander-in-chief of the



MUSCLE

1. B, biceps muscle; O, origin, attachment to scapula by two tendons; L, insertion on radius.
2. Diagrammatic representation of nerve, F, and its end-plates on a striated muscle fibre; N, nucleus.
3. Connected cells of cardiac muscle (diaphragmatus); N, nucleus.
4. Unstriated muscle fibre (diaphragmatus); C, cytoplasm; N, nucleus

waste products. See also CLONUS OR REFLEXES. See Sir W. Mackenzie, *The Action of Muscles*, 1918; J. F. Fulton, *Muscular Contraction*, 1926; A. V. Hill, *Muscular Activity*, 1926; and A. D. Ritchie, *The Comparative Physiology of Muscular Tissue*, 1928.

Muscovy, name properly applying to the ancient principality of Moscow, but used in the sixteenth and seventeenth centuries to mean the whole of Russia.

Muscovy, or Musk, Duck (*Cairina moschata*), species of wild duck native to Central and S. America, where it nests in the trees of forest swamps. It is often reared in poultry yards of European countries as an ornamental bird for lakes and parks. It is also called Barbary duck.

Free Fr. naval forces (1940-42), and of the Free Fr. air forces (1940-41). M. led the Free Fr. naval forces in the occupation of Saint-Pierre and Miquelon Is. against the representatives of the Vichy Govt. there. He was made national commissioner of navy and merchant navy in the Fr. National Committee, but resigned in March 1942 and in the following year became assistant to Gen. Giraud (q.v.) in Algiers. After the war he was chief of the Fr. naval delegation of the military mission for Ger. affairs till 1945. Founded a new political party called the Union for the Defence of the Republic (1946). Hon. K.C.B.; Grand Officer of the Legion of Honour.

Muses (Lat. *Musa*, Gk. *Mousai*) were, according to the earliest writers, the

inspiring goddesses of song, and, according to later notions, divinities presiding over the different kinds of poetry, and over the arts and sciences. They are usually represented as the daughters of Zeus and Mnemosyne, and *b.* in Pieria, at the foot of Mt. Olympus. Their original number appears to have been three; but afterwards they are always spoken of as nine in number. Their names and attributes were: (1) Clio, the muse of hist., represented in a sitting or standing attitude, with an open roll of paper, or chest of books. (2) Euterpe, the muse of lyric poetry, with a flute. (3) Thalia, the muse of comedy and of merry or idyllic poetry, appears with a comic mask, a shepherd's staff, or a wreath of ivy. (4) Melpomene, the muse of tragedy, with a tragic mask, the club of Hercules, or a sword; her head is surrounded with vine leaves, and she wears the cothurnus. (5) Terpsichore, the muse of choral dance and song, appears with the lyre and the plectrum. (6) Erato, the muse of erotic poetry and mimic imitation, sometimes also has the lyre. (7) Polymnia or Polyhymnia, the muse of the sublime hymn, usually appears without any attribute, in a pensive or meditating attitude. (8) Urania, the muse of astronomy, with a staff pointing to a globe. (9) Calliope or Callopea, the muse of epic poetry, represented in works of art with a tablet and stylus, and sometimes with a roll of paper or a book. The worship of the M. was introduced from Thrace and Pieria into Boeotia; and their favourite haunt in Boeotia was Mt. Helicon, where were the sacred fountains of Aganippe and Hippocrene. Mt. Parnassus was likewise sacred to them, with the Castalian spring.

Museums (from Gk. *mousion*, temple of the Muses), name now given to buildings where collections of scientific, literary, and natural curiosities and works of art are stored for the benefit of the public. The first of the kind was the famous univ. building at Alexandria (including the library). Here were lodged and entertained the men of learning, each of whom had a handsome revenue. Its foundation is attributed to Ptolemy Soter (c. 283 B.C.). A library or picture gallery may be included, but in Britain does not usually form the sole or even the most prominent feature of M. properly so called, though on the Continent the terms 'musée' and 'museum' are regularly used for such collections. These institutions remained practically unknown from the fourth to the seventeenth century, and the earliest were merely mindless collections of curiosities, amassed without method or system, usually by private individuals, such as the Tradescant Museum, which became more valuable as the Ashmolean Museum (c. 1679), at Oxford. The growth and development of the modern M. were a feature of the later nineteenth century, the chief aims (as enunciated in 1870) being to provide education and recreation for the people. Ideal M. should teach the connection between the different branches of learning, and destroy the arbitrary distinction drawn between M.

or 'science' and of 'art.' Lack of space has sometimes been responsible for such separations, notably in the case of the transfer of the natural hist. specimens to Cromwell Road, S. Kensington, from the Brit. Museum in Bloomsbury (founded c. 1753 from the Sloane collection). The Guimet Museum at Paris is a museum of religions; the Pitt-Rivers Museum at Oxford illustrates the evolution of man-made objects. The Fitzwilliam Museum Cambridge possesses an excellent collection of engravings, MSS., and books left by its founder, Viscount Fitzwilliam; the 'Hunterian M.' of the Royal College of Surgeons is a museum of comparative anatomy. Noted M. of wider and more general aim are the Vatican in Rome (started by Pope Julius II.), the Uffizi and Pitti (chiefly painting and sculpture) at Florence, the Louvre of Paris (opened to the public c. 1789), M. at Leningrad, Dresden, Munich, Berlin, Vienna, Naples, Milan, Venice, and in America the Carnegie Institute at Pittsburgh, Pennsylvania (1896), and the National Museum at Washington (c. 1876), under the control of the Smithsonian Institution. M. may be under national, prov., or municipal control, or run by a semi-public body, such as a univ. or a trade guild. Many national M. originated in private collections, as, for example, the 'Hunterian M.' of the Royal College of Surgeons, London, and of Glasgow Univ., and above all the Brit. Museum itself. Holland formerly had many collections owned by her merchant princes. The various great exhibitions, and especially that of 1851, did much to promote interest in M. and led to the estab. of many in the nineteenth century. Somewhat similar arrangements are made in the science exhibitions at S. Kensington where a wide range of mechanical appliances is prepared so that students may obtain instruction by setting in motion a number of working models. Medical and surgical M. are important to scientific training and are added to modern univs. granting surgical and medical diplomas. The wax model exhibition at Guy's Hospital is particularly famous. A comparatively modern movement is that of displaying exhibits of particular interest to the dist. This is done by the Geffrye Museum in Kingsland Road, London, which lies in the centre of the furniture-making industry. One of the most interesting collections formed of late years consists of exhibits relating to the First World War which are now housed in the Imperial War Museum, Lambeth Road, S.E.1.

Despite the fact that bombing caused many of London's M. to remain closed for some time after the war, there was evidence, as early as 1946, of a greatly increased interest in the M. Thus the Natural Hist. Museum, with its galleries completely closed, was selling far more of its publs., including serious scientific works, than before the war. Attendances at the Science Museum were almost double those of the years before 1939 and, similarly, there were greatly increased attendances at the Victoria and Albert

Museum, although only a few of its galleries were open. The Imperial War Museum, the only big museum in central London S. of the Thames, had, even by mid 1946, only a very small part of its exhibition space in a fit state for use; the great bulk of its galleries, though not actually destroyed by bombing, was still not usable. The London Museum (Lancaster House) suffered no great damage from bombing, but was required by the Gov. for offices and conferences, and for a time it seemed doubtful whether it would continue as a museum, although by the will of the late Lord Leverhulme the intention was to present his unexpired Crown lease to preserve a home for the London Museum and only secondarily to provide a setting for the above-mentioned uses. It is (1949) understood that the museum will be reopened in about eighteen months' time, not at Lancaster House but in a part of Kensington Palace. Also damaged was Sir John Soane's Museum in Lincoln's Inn Fields, which is not strictly a museum but, rather, a special trust. The Natural Hist. Museum or, in other words, the Brit. Museum (Natural Hist.), one of the great national scientific institutions, suffered severely from bomb damage, both to the building and to the exhibition cases, and it will be many years before the exhibition galleries are completely restored. In all, the damage suffered by museum buildings in London during the war amounted to £1,294,000. But very little damage was caused to their contents, apart from the loss of 200,000 books in the Brit. Museum library and some 30,000 vols. of prov. newspapers at its newspaper library at Hendon. It is planned to construct a new library building for the Brit. Museum on land adjacent to the museum, and a new ethnographical building at the N.E. corner of the museum site. The latter would take the place of the Ethnographical Museum at S. Kensington, suggested in the 1938 scheme of the Standing Commission on M. and Galleries, and would possibly allow of the removal of the contents of the India section of Victoria and Albert Museum to Bloomsbury. (Third Report of the Standing Commission on M. and Galleries, H.M.S.O., 1948.)

In recent years M. have been increasingly used for educational purposes in consequence of the adoption of methods of visual teaching. This method of instruction is largely adopted in the U.S.A., and instruction of this nature is afforded in the Brit. Museum where at stated hours lectures are given to groups of school children, students, and visitors. For full information on normal arrangements at the chief M. in the United Kingdom see *Whitaker's Almanack*.

See L. Viardot, *Les Musées d'Europe*, 1860; P. Blanche, *Rapport sur les musées d'Europe*, 1885-90; T. Greenwood, *Museums and Art Galleries*, 1888; A. Baeborn, *Le Louvre et son histoire*, 1893; Sir W. Flower, *Essays on Museums*, 1898; D. Murray, *Museums: Their History and Their Use*, 1904; V. Scherer, *Deutsche Museum*, 1913; M. T. Jackson, *The Museum*, 1917;

O. Hamburger, *Museumkunde* (with bibliography), 1924; *Report of Royal Commission on National Museums and Galleries*, 1925; C. R. Richards, *Industrial Art and the Museum*, 1927; H.M.S.O. (pub.), *Museums and Art Galleries*, 1933; Board of Education (ed.), *The Museums and the Schools*, 1933; A. S. Wittlin, *The Museum and The Museum: Its History and its Tasks in Education*, 1949; and ann. reports of the world's chief M.

Musgrave, Samuel (1732-7). 1780, Eng. classical scholar and physician. He wrote *Exercitations in Euripides* (1762); *Two Dissertations on 'OK. Mythology and on Newton's Objections to the Chronology of the Olympiads'* (1782); *Animadversiones in Sophoclem* (1800); and works on medical subjects. Helped edit Euripides (4 vols., 1778). His notes on Sophocles were bought by Oxford Univ. after his death, and were included in an ed. of the tragedies pub. at Oxford in 1800. See Schweighäuser's ed. of Appian; *Gentlemen's Magazine*, 1770; and J. Nichols, *Literary Anecdotes*, 1781.

Musgrave, William (c. 1657-1721), Eng. physician and antiquary, studied at Oxford. He was secretary to the Royal Society (1685), and settled in Exeter (1691), practising as a physician. He wrote treatises on gout and medicine. His three antiquarian studies, *Julia Vitalis Eptaphium* (1711), *Geta Britannicus* (1716), and *Belgium Britannicum*, were reissued as *Antiquitates Britannico-Belgicae* (1719). For these researches he was presented by George I. (some say his son, the Prince of Wales) with a diamond ring on Aug. 6, 1720. See A. a Wood, *Athena-Oron*, iv. (Bliss, ed.), and W. Mumk, *Coll. of Phys.* i. (2nd ed.), 1878.

Mushroom (*Agaricus psalliota campestris*), very variable Brit. fungus, which has long been valued for its edible qualities, and has been cultivated from 'spawn' since the seventeenth century. The 'spawn' is obtained from rich old pastures where horses and cattle have been feeding, and is made up with moderately dry cakes of dung and earth. If properly prepared it lasts fit for use for five years, the fungus being in a white thread-like form (mycelium). Except during a few weeks in autumn the supply of good fresh Ms. falls far short of the demand; but their production throughout the year is not specially difficult, and while the crop is profitable in itself, the spent manure from M. beds is all important in the success of modern methods of intensive culture. The crop can be raised in the open air, in frames, sheds, or cellars, as well as natural caves, mines, or railway tunnels, wherever an even temp. of from 55° to 60° can be maintained from the fermenting manure. In the open the M. bed is made ridge-shape on the driest possible site; elsewhere it is made flat. The use of manure from horses fed largely on corn and littered with long straw is essential and the decline in the number of horses in Great Britain in recent years has presented M. growers with a serious problem; efforts have been made to find

a synthetic compost which will serve as a growing medium. There are no rough and ready distinctions of Ms. from other fungi; but the botanical features, though variable, make identification easily possible. When young it is globose, expanding until nearly flat, and from 3 to 6 in. across. It is white, and the thick flesh turns brown when cut or broken. The stem is stout, with a ring or frill near the top; and the crowded gills turn from rosy to dark brown. It occurs naturally in rich, open ground, not under trees. See also CHANTARKEE and FUNGI. See E. Step, *Toadstools and Mushrooms of the Countryside*, 1931; W. F. Bewley and J. Harnett, *Cultivation of Mushrooms for Amateurs*, 1935; and L. L. Pray, *Common Mushrooms*, 1936.

Mus., although in its modern form the most artificial of the arts, is primarily the most universal and spontaneous. It differs from the other arts in that 'time,' both in the rhythmic basis of M. and also in the definite duration of any musical phrase or performance, is an essential factor. In this it contrasts sharply with painting and architecture, which depend on spatial values, and it lacks the representational element in poetry, although poetry, M., and the dance probably had a common origin in ritual. They still share the vital elements of rhythm. Structurally M. is allied to mathematical science, the two fundamental concords, the octave and the perfect fifth, being built up from the frequency-ratios 2 : 1 and 3 : 2 respectively. These facts were known in the sixth century B.C. to Pythagoras, who also defined the tonal position of the fourth.

M. in some form is probably as ancient and universal as speech; but in the general acceptance of the term, Gk. M. is the radix from which its development must be traced. Gk. M. was, doubtless, largely influenced by Chaldean and Egyptian, by Indian and Chinese, such as it was; and sev. early Christian chants were derived from Jewish synagogue tunes. But no deep study of such influences is possible, although it is surmised that ample material would have been available if the Alexandrian library had been preserved. Musical intonation was an important feature of all Gk. drama, and even the Homeric epics were declaimed to the accompaniment of a lyre. The term M. was held by the Gks. to signify any art over which the nine Muses presided, and poetry and melody were combined in one art form as a matter of course, although harmony in the modern sense was unknown—a characteristic which still persists in M. uninfluenced by the European tradition. The Gk. system was based on the tetrachord, a group of four notes derived from the four strings of the early lyre; the total span was a fourth, but three genera were recognised, whereby the two lower notes could be diatonic or chromatic or enharmonic (i.e. including quarter-tones). With the development of the lyre the span was increased to two octaves by the super-

imposition of four tetrachords; hence were derived the modes, eight-note scales whose character depended on the position of the *mese*, the upper note of the second tetrachord, which acted as a kind of tonic. Each mode was associated with a particular mood, and had a moral quality. Thus the Dorian mode was regarded as military and masterful, the Lydian as effeminate. At first all M. was handed down orally, as folk M. has continued to be, but with such importance attaching to M. as a literary adjunct, although its possibilities as an absolute art were unsuspected, it was not long before some method of definite systematisation and notation of sound was sought. The Gks. developed two such systems, one for vocal and one for instrumental M., based on the letters of the alphabet, which could be differently placed so that half- and quarter-tones could be recorded. Under the Romans, the chromatic and enharmonic genera and the tetrachord basis of the system fell into disuse, and the whole tradition might have been lost but for the Christian Church. In the early days the congregation took a musical part in the service, and the M. naturally took over many Gk. and Jewish elements (cf. the verbal survival of *Kyrie Eleison* and *Alleluia*). Control gradually passed to the priesthood, who regularised it in the form of plainsong and *estab.*, the ecclesiastical modes. These are derived from the Gk. modes, with important differences; the Gk. names were applied to them by the theorist Boethius (*d. c. A.D. 524*). The Church frowned on instrumental M., and at first there was no rhythmic independence owing to the melody being tied to the scansion values of classical poetry. The commonest method of notation was the system of *neume*, but this served only to remind the singer of the approximate difference in pitch of successive notes in a melody he had already memorised, without expressing the exact intervals. It was not until the early tenth century that any definite progress in notation was made, although the literal code, in which Lat. characters had superseded the Gk., had been developed, and the modern seven-letter method began to be used in conjunction with the *neuma*. About the time of Huebal (d. 930), whose system of writing words in the spaces of a staff representing the strings of an instrument, useful in vocal M., did not survive him, a red line was drawn horizontally across a page to represent F; and the immediate addition of a green or yellow line above and parallel to the red, to give the locus of C, made possible the precise expression of any interval up to an octave. The present type of staff was reached in the eleventh century; it consisted usually of four lines, although no number was definitely settled until the sixteenth century, when a four-line staff was restricted to plainsong, five-line being used for other vocal M. and six-line for organ and virginal. Signs F, C, and G were also written to their relative lines, thus originating the system of clefs. Bars, or staff-divs., were introduced about 1450 to

indicate accent; their use for rhythmic definition did not become general till the sixteenth and seventeenth centuries. Many of these improvements have been attributed to Guido d'Arezzo (*d. c.* 1050); but probably he did no more than systematise the general progress of the art. We owe to him the familiar symbols of solmisation (*ut, re, mi*, etc.), based on the opening syllables of each line of a hymn to St. John the Baptist.

By this time, aided by the progress in notation, M. had reached the stage of the 'descant,' or 'discantus' (see HARMONY), from which the whole art of counterpoint was evolved, although the Gk. practice of 'magadising' (*i.e.* singing in two parts, one an octave above the other) had been an attempt in the same direction. The *organum*, in which a series of fourths or fifths was added to a *canto fermo*, was the first step; its origins go back to the ninth century and may have been due to the inability of singers to remain in unison. Further intervals, oblique and contrary motion, and a feeling for cadences were added by degrees, and the hexachord system was adopted as a scientific guide to teaching. This pointed towards the major scale, but such implications were regarded as *musica ficta* and not followed to their conclusion. Composition at this time was an arbitrary process, governed by scientific rather than aesthetic rules; M. was classed with mathematics in the medieval univs. The twelfth and thirteenth centuries, sometimes called the Franco-Norman period after the theorist Franco of Cologne, saw the development of the rhythmic modes, based on the old poetic metres, and further attempts to define consonance and dissonance. More than two independent parts were now allowed; the main voice was usually in the tenor, with the other parts embroidering above and below it. Among the new forms of vocal M. were the *conductus*, motet, rondeau, and rota (or round), which introduced the principle of canonic imitation. The most famous example of this type is *Sumer is icumen in* (MS. *c.* 1280, Brit. Museum; see article in Grove's *Dictionary of Music*), a flowing four-part canon over a brief two-part rondeau, also in canon, probably the result of treating a popular tune in the manner of contemporary church music. These early polyphonic problems gave rise to a considerable theoretical literature, chiefly written by monks.

Meanwhile secular M. had also changed; crude chants and folk-songs had given place to the heroic songs of the minstrels (*g.v.*) of the tenth and eleventh centuries. During the twelfth and thirteenth centuries the troubadours and trouvères in France, and the minnesingers and meister-singer in Germany became prominent; many of them were of high rank, e.g. Count William of Poitiers (*d. 1127*), and Richard I. of England (*d. 1199*). This movement was stimulated by contact with the E. through the crusades, the spread of the chivalry ideal, and the growth of the vernacular languages. It was concerned with poetry as well as music, but

had great musical influence owing to its rhythmic freshness and the strong folk element, which helped to loosen the old academic rules. The same period saw a great increase in instrumental M.; its notation was by means of tablatures based on the form of the instruments. The trouvère Adam de la Halle (*d. c.* 1287) wrote M. for a pastoral comedy and pointed the way to opera. The fourteenth century saw the introduction of a new method called *trs nora*, in which the rhythmic modes were superseded, duple time was used as well as triple, and other new devices, such as *faujourdon*, were added. The leading composer was Guillaume de Machaut (*d. 1377*).

The great polyphonic period began in the fifteenth century with the foundation of royal chapels, an enormous increase in technical resources, especially in imitative counterpoint, and the rise of national schools. In England Dunstable (*d. 1453*) achieved much greater smoothness of texture. The great Netherlands school, headed by Binchois (*d. 1460*), Dufay (*d. 1474*), and Ockeghem (*d. 1495*), reached its height in Josquin des Prez (*d. 1521*). Later Netherlands composers founded schools in other countries, e.g. Willaert (*d. 1562*) and Cyprien du Rore (*d. 1565*) in Venice and Arcadelt (*d. c.* 1575) in Rome, where the tradition of polyphonic church M. reached its apex in the work of Palestrina (*d. 1594*) and the Spaniard Vittoria (*d. 1611*). The greatest of the Flemings, Lassus or Lasso (*d. 1594*), was a prolific composer in all styles, sacred and secular. This period was marked by the gradual decline of the modal system and a much greater interest in the emotional use of harmony as against polyphonic devices for their own sake. A stimulus was also given to Ger. church M. by the Lutheran Reformation, which encouraged congregational singing and popularised the chorale. Eng. church composers of the period were Tye (*d. 1573*), Tallis (*d. 1585*), Byrd (*d. 1623*), and Gibbons (*c.* 1625). Meanwhile secular music, aided by the Renaissance and the discovery of printing, flowed rapidly in the Fr. *chanson* and the It. madrigal, which was a cross between the popular *frottola* or street song and the Flem. motet. Marenzio (*d. 1599*), Gesualdo (*d. 1614*), and Monteverdi (*1567-1643*), introduced new freedom and expressiveness into the madrigal, which perhaps found its perfect form in England in the works of Morley (*d. 1603*), Weelkes (*d. 1623*), Wilbye (*d. 1638*), Byrd and Gibbons. The first to write important original M. for the organ (introduced from the E. in the eighth century, but for long very primitive) was the Venetian Andrea Gabrieli (*d. 1586*), who developed the *ricercare* and *toccata*. He was followed by Merulo (*d. 1604*), Sweelinck (*d. 1621*), and Frescobaldi (*d. 1644*), in whom the fugue reached mature form. Much early instrumental M. was simply transcribed from the motet, but dances were written for the lute and the popularity of the new domestic keyboard instruments gave rise to a true instrumental style, especially in England

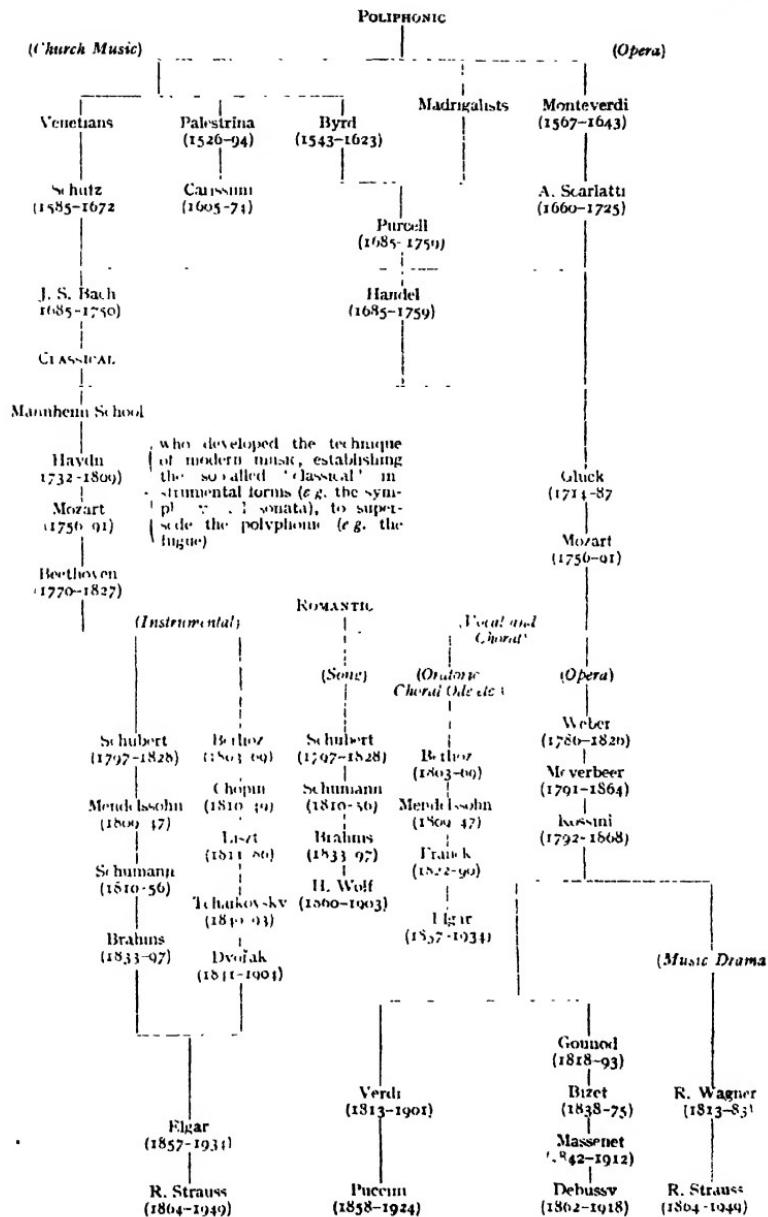


DIAGRAM SHOWING THE CHIEF LINES OF DEVELOPMENT OF MUSIC TO THE MIDDLE OF THE TWENTIETH CENTURY AND THE RELATIVE POSITIONS OF THE PRINCIPAL COMPOSERS

and Italy. It found expression in suites, variations, and primitive programme M. Fantasies for groups of viols are the ancestors of chamber M. An early master of orchestral M. was Giovanni Gabrieli (*d.* 1612), who wrote antiphonal works for contrasted groups of instruments.

The next new forms, both originating in Italy about 1600, were opera and oratorio. Opera was an attempt to revive the Gk. combination of M. and drama, and was also influenced by the madrigal; its first exponents were the Florentines Peri (*d.* 1633) and Caccini (*d.* 1618), but Monteverdi was the first master (see OPERA). His influence on the hist. of M. was enormous. He introduced string tremolando and pizzicato, and his harmonic advances led to the final substitution of key for the modal system. The first opera house was opened at Venice in 1637, and a thriving tradition began. Oratorio, in part evolved from the incidental M. of the early miracle and morality plays, began in Rome with Cavalieri (*d.* 1602). At first it was staged like opera, but Carissimi (*d.* 1674) endeavoured to separate it by strengthening the choral element. In Germany Schütz (*d.* 1672) produced a new type by combining Venetian influence with old Ger. Passion M., while a flourishing school of keyboard composers arose in Froberger (*d.* 1667), Buxtehude (*d.* 1707), Reincken (*d.* 1722), and Pachelbel (*d.* 1706) for the organ, and Kuhnau (*d.* 1722) for the harpsichord. All these traditions were consummated in the work of J. S. Bach. Italy still led the field in other instrumental forms, especially for strings, thanks to the perfection of the violin by the craftsmen of N. Italy. The trio, sonata, and concerto were developed by Corelli (*d.* 1713) and Vivaldi (*d.* 1741), and the harpsichord sonata by Domenico Scarlatti (*d.* 1757). Meanwhile It. opera had overrun Europe, but only in France, where Lully (*d.* 1687) combined it with the ballet, was a national style founded. In England Purcell (*d.* 1695) showed high dramatic genius but *ostab.* no tradition. Opera was standardised by Alessandro Scarlatti (*d.* 1725), after whom it declined into empty formulas (see OPERA).

The first half of the eighteenth century is dominated by the figures of Handel (1685–1757) and J. S. Bach (1685–1750). Handel's style was cosmopolitan, comprising It. and Eng. as well as Ger. elements, and his genius essentially dramatic, as shown in his Jewish oratorios even more than his forty It. operas, although he used all the known forms. He combined unsurpassed lyric sweetness with massive choral effects on a greater scale than ever before. Bach's genius was religious and contemplative, introvert rather than extrovert; his Passions, church cantatas, and organ works are the summit of their kind. He was also the composer of many excellent violin and clav. M., and carried the new tonal polyphony to its utmost limits. Thanks largely to him a whole new world of keyboard M. was opened up by the general acceptance of 'equal temperament' (see TEMPERAMENT) which rendered possible

a greatly extended variety of modulations. But his full influence was delayed, since his greatest M. remained unknown for nearly a century. In France his most important contemporaries were François Couperin (*d.* 1733) in keyboard M. and Rameau (*d.* 1764) in grand opera and ballet. It was in France too that Gluck (1714–87) completed his memorable reform of opera, designed to end the tyranny of singers, emphasise dramatic expression, and so return to the principles of Monteverdi and the Gks. The middle years of the century saw the rise of an important movement led by Johann Stamitz (*d.* 1757) at Mannheim, where the modern orchestra and the symphony were evolved, and sonata form, based on key contrast and a reaction from polyphony, began to come into its own. It was derived partly from the binary form of the old dance movements and partly from the operatic aria of Scarlatti and Handel. C. P. E. Bach (*d.* 1788) created the modern piano sonata by applying sonata form to the colour possibilities of the new instrument. Symphony, sonata, and string quartet were all perfected by Haydn (1732–1809), the first of the great Viennese classical composers, and further extended by Mozart (1756–1791), whose use of chromaticism introduced an almost romantic expressiveness. He was the one composer to reach the highest rank in every musical form; his operas, remarkable for their subtle characterisation, both summed up the whole It. tradition and led by way of Ger. *Singspiel* to romantic opera. Judging by his experiments in harmony and 'colour,' and by the perfection to which he developed the new forms (including the concerto, which he made particularly his own), it has been suggested that, but for his premature death, he would have done much that Beethoven (1770–1827) was left to accomplish. But however much Beethoven's earliest M. may resemble Mozart's latest, his second and third period works, his sonatas, concertos, and chamber M., no less than his wonderful symphonies and overtures, opened up vast new ter. in the realm of individual and subjective expression. His last works, long misunderstood, looked far into the future.

If Beethoven is the point of transition from 'classical' to 'romantic' (the terms are unsatisfactory, but have a generally accepted significance) in instrumental M. the same must be said of Schubert (1791–1828) in song, and of C. M. von Weber (1786–1826) in opera. The Romantic movement (q.v.) of the early nineteenth century was a general artistic reaction against 'academism' and formalistic narrowness; it appealed to the remote, violent, and mysterious, became connected with political and social ideals, and ended as a cult of the excessive. Romantic M. soon developed a strong literary content, and sought to express alien ideas of all kinds, often at the expense of formal balance. Beethoven influenced the whole of nineteenth-century M., but in many different ways. The classical tradition of sonata and symphony was followed (with

deviations) by Mendelssohn (1809-47) and Brahms (1833-97). The leaders in piano M. were Chopin (1810-47) and Schumann (1810-56), whose attempts at the larger forms were less successful. The mantle of song passed from Schubert to Schumann, Brahms, and Wolf (1860-1903). The first great exponent of programme M. was Berlioz (1803-69), whose remarkably original powers of melody, drama, and orchestration were not at first recognised. Liszt (1811-86), besides exploiting the virtuous powers of the piano and making important harmonic innovations, evolved from the symphonic form of Beethoven, the colour of Berlioz, and certain elements in Schubert's instrumental works a new form, the 'symphonic poem,' in which he practised an elaborate method of theme transformation. This form has been cultivated by many later composers, most successfully by Richard Strauss (1864-1949). The central musical figure of the period was Wagner (1813-83) who, beginning as a composer of grand opera in the Meyerbeer manner, combined Beethoven's method of symphonic development, Liszt's theme transformation, and certain of Gluck's ideals in a vast new stage form, the M. drama, which he described and justified in numerous prose writings. It is peculiar to Wagner and has defied would-be successors, although the operas of Strauss approach it at some points. It is closer to the symphonic poem than to true opera, which it did not supersede. Indeed opera flourished throughout the century, particularly in Italy and France, where the spectacular methods of Meyerbeer (1791-1864) were succeeded by the more lyrical style of Gounod (1818-93), Massenet (1842-1912), and others and the revitalised *opéra-comique* of Bizet (1838-75). In Italy the traditional line led through Rossini (1792-1868), Donizetti (1797-1848) and Bellini (1801-35) to Verdi (1813-1901), in whom it reached the height of musical and dramatic expressiveness. It then declined into imitative realism, but Puccini (1858-1924) showed a strong lyrical and dramatic gift.

Related to the Romantic movement are the nationalist movements, which drew much of their strength from folksong. In Russia the movement began with Glinka (1803-57) and reached great distinction in the instrumental works of Balakirev (1837-1910) and Borodin (1833-1887) and the operas of Mussorgsky (1839-1881) and Rimsky-Korsakov (1844-1908). Tchaikovsky (1840-93), who used all forms except church M., was more influenced by the W. romantic tradition; his symphonies have a strong subjective element. In Scandinavia Grieg (1843-1907) showed a genius for the song and short piano piece, and Sibelius (b. 1865) for the symphony. In Bohemia Smetana (1824-84) founded a national opera, later enriched by Janáček (1854-1928), and Dvořák (1841-1904) enriched the classical forms. Later a lively Sp. school grew up under Albéniz (1860-1909), Granados (1867-1916), and Falla (1876-1946). The end of the century saw the decline of the

classical Austrian tradition in the verbose symphonies of Bruckner (1824-96) and Mahler (1860-1911) and the rise of important new movements in France and England. Franck (1822-90) late in life popularised cyclic form by applying Liszt's methods to the sonata, and the far-ranging harmonic experiments of Debussy (1862-1918) bore fruit in 'impressionism.' Ravel (1875-1937) developed on similar lines with a personal harmonic idiom, and the exuberance of Chabrier (1841-94) and the harmonic subtlety of Fauré (1845-1924) also left their mark. In England Elgar (1857-1934) added a personal and national flavour to the classical tradition in large-scale choral and instrumental works, and Delius (1862-1934) adopted an intensely individual harmonic style. Holst (1874-1934) and Vaughan Williams (b. 1872) returned to folk M. and built up a style capable of mastering both traditional and modern forms on the largest scale.

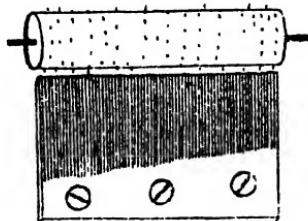
The twentieth century has seen a development in M. of revolutionary rapidity to which there have been two main contributing factors: first the break-up of the key system, largely due to the influence of Wagner and Debussy, and the search for free forms, new rhythmic patterns, 'atonality' (the abolition of 'key'), polytonality, and harmonic systems built on the whole-tone, dodecuple, and many other more intricate scales; secondly the rapid perfection of mechanised M., notably wireless, gramophone, and cinematograph reproduction. Two of the biggest influences in modern M. are Stravinsky (b. 1882), who has formed no definite 'style,' but has experimented in many new and daring rhythmic forms and 'tone-colours,' and Schönberg (b. 1874), whose somewhat arbitrary twelve-tone system has been adopted in certain quarters, notably by Berg (1885-1935); but it is quite possible that the main stream of M. will be found to have passed them by. Other important modern composers, apart from those mentioned above, are Hindemith (b. 1895) in Germany; Bartók (1881-1945) and Kodály (b. 1882) in Hungary; Honegger (b. 1892) and Poulenc (b. 1899) in France; Pizzetti (b. 1880) and Malipiero (b. 1882) in Italy; and in England and America, Bax (b. 1885), Ireland (b. 1879), Bloch (b. 1880), Bliss (b. 1891), Copland (b. 1900), Rubbra (b. 1901), Walton (b. 1902), Berkeley (b. 1903), Barber (b. 1910), and Britten (b. 1913). In the period after the First World War the reaction against the excesses of romanticism took an extreme form, resulting (as in the other arts) in various forms of selfconsciousness and exhibitionism, which hardly helped to solve the problem of development. Recently there have been signs that it may be possible soon to distinguish the main course from the subsidiary disturbances. The other important present-day factor, the mechanisation of M., has brought knowledge and appreciation of M., especially classical M., to a vast hitherto uninterested public, and splendid performances of all important works can be

heard through the media of wireless and the gramophone. The standard of criticism, and thus of performance, is rising, and the demand for new M., for instance in the cinema, can hardly fail to encourage the composer. Jazz (*q.v.*) M. is a conspicuous contemporary phenomenon throughout the U.S.A. and Europe, as a dance-form and for mechanical transmission. Primarily it is an exploitation of syncopated rhythm, usually at the expense of other musical qualities, and it owes much to primitive Negro M. It is largely ephemeral, but may leave its mark on a few surviving works. A more significant phase of the popularisation of M. is the revival both in Europe and America of musical festivals and societies and the high standard of performance that distinguishes their concerts. See also articles on HARMONY; OPERA; ROMANTIC MOVEMENT; SCHOOLS OF MUSIC; SONG, etc., on M. under individual countries, and on the various composers.

Sir Grove's *Dictionary of Music and Musicians*; *Oxford History of Music*, H. Foss (ed.), *The Heritage of Music*, 1927; Sir D. F. Tovey's articles in *Encyclopædia Britannica*, 1929, especially that on 'Music'; W. J. Turner, *Music: a Short History*, 1932, 1949; P. Scholes, *The Oxford Companion to Music*, 1939; P. H. Lang, *Music in Western Civilisation*, 1941; E. Blom, *Everyman's Dictionary of Music*, 1946; and T. M. Finney, *A History of Music*, 1948.

Music, Abbreviations in, see ABBREVIATIONS.

Musical Box, instrument for producing music by mechanical means. It was invented in the middle of the eighteenth



MUSICAL BOX

century by the Swiss, who fitted minute plugs on a metal cylinder so arranged that they would strike separate bars of steel and set them vibrating, and so produce different tones. The M. B., however, has long been superseded by the piano-player and the gramophone.

Musical Clocks, see under HOROLOGY.

Musical Comedy, form of theatrical entertainment, developed from *opéra bouffe* and distinguished from opera by having spoken rather than sung dialogue. It has many of the characteristics of vaudeville (*q.v.*)—singing, humorous situations, topicality, and burlesque—but differs in having a loosely-connected plot, interspersed with songs. Musical plays

of this type first found their outstanding popularity with the London productions of George Edwards (1852-1915) at Daly's Theatre and the Gaiety. *The Shop Girl* was produced in 1894 and ran for two years, followed by, among others, *The Grisha*, *San Toy*, *A Country Girl*, and *The Maid of the Mountains*, which ran for over 1300 performances. Ivan Caryll, Sidney Jones, Franz Lehár, Oscar Strauss, and Harold Fraser-Simson were among those who wrote the music for the successful productions of this epoch. M. C. has since continued to maintain its hold on public favour, being associated in particular with the names of C. B. Cochran (*b.* 1872) in London and of Florenz Ziegfeld (1867-1932) and Earl Carroll (*b.* 1893) in New York.

Musical Glasses were a set of glasses of equal size, forming a musical instrument; they contained varying quantities of water, the height of the water in any particular glass determining its note. The method of playing was by rubbing the moistened finger round the rim of the glasses. They are first mentioned in 1651, and were very popular in the eighteenth century, being played in London by Gluck in 1746, whilst Mozart and Beethoven wrote music for them. As improved by Franklin in 1760, M. G. were often called a 'harmonium.'

Music and Dancing Licences. Within the Metropolitan Police dist. (*i.e.* within 20 m. of the cities of London and Westminster, or in Middlesex) every house, room, garden, or other place used for public music or dancing must be licensed for that purpose by the co. council or co. bor. council within whose jurisdiction the place is situated. Elsewhere licences are required only in those tns. where section 51 of the Public Health Act, 1890, has been adopted, in which cases the licences are granted by the magistrate. The mere occasional use of a room for music and dancing, or a temporary use for dancing on the occasion of a festival, does not, but a skating rink where music is played does, require a licence. The decided cases show that to require a licence there must be something habitual about the use of the place for public music or dancing, though using the place once a month only would probably be regarded as 'habitual.' The licensing authority have an absolute discretion to grant or refuse a licence, subject to the obligation to exercise the discretion in a judicial manner.

Music Halls. The 'music hall,' or 'variety theatre,' is a development of the 'saloon theatres,' which existed in London in 1830-40. These were attached to taverns, and were very popular amongst the middle and lower classes who liked to mix their dramatic amusements with smoking and light refreshments. They gave dramatic performances as well as variety entertainments, but were restricted by the 'patent rights' which were ultimately abolished through the efforts of a number of distinguished literary men, among whom were Charles Dickens, Sir Edward Bulwer-Lytton, and Sir Thomas Noon Talfourd. After this the saloons

gradually improved in character, and the M. H. of to-day began to appear, the first being the Canterbury in Lambeth, which, under the direction of Charles Morton, cultivated the best class music; indeed 'An Operatic Selection' of Gounod's *Faust* was first performed in England here. Morton also opened the Oxford, and other halls soon followed, their popularity being assured by the cheap prices and physical comforts which they afforded. But the advance in the M. H. excited the jealousy of the theatre, and matters came to a crisis in 1865 when an ambitious ballet was produced at the Alhambra in Leicester Square. The Alhambra was prosecuted for infringing the Stage-play Act, and a long, unsatisfactory trial followed, with the result that the matter was taken up by Parliament, and the M. H. were granted the privilege of producing ballets, vaud-veilles, pantomimes, and other light pieces. Some of the chief in the list of M. H. are the Coliseum, the London Hippodrome, the Pavilion, and the Palladium, and associated with them and older halls are the names of George Leybourne, Bessie Bellinore, Harry Champion, the Great Vance, Charles Coburn, Chirgwin, the White-eyed Kaffir, Gus Elen, and Marie Lloyd. The advent of the cinema, and especially the development of sound films, seriously affected the prosperity of M. H., and many were converted into cinema houses, the Empire and the Tivoli of London being notable examples. At the present time the term 'music hall' is giving place to the more applicable name of 'variety theatre,' the programme of entertainment often taking the form of 'revue.' See A. Hadden, *The Story of the Music Hall*, 1935; M. W. Fisher, *Winkles and Champagne*, 1938; and H. Scott, *The Early Doors*, 1947.

Music, Royal College of, see ROYAL.



MUSK

Musk (*Mimulus moschatus*), small perennial plant of the order Serophulariacen., with hairy leaves and bright yellow flowers. Some fine horticult. varieties

have been introduced. These are best grown in pots trained on wire frames or in hanging baskets.

Musk, Artificial, substance known chemically as symmetrical trinitrotertiarybutyltoluene. It is used in perfumery as a cheap substitute for natural M., which it closely resembles in odour.

Musk Deer (*Moschus moschiferus*), native of the mountainous parts of Central Asia, which yields the musk of commerce. It is a small animal about the size of a roe-deer, 20 in. in height, with large ears, long legs, and coarse, goat-like hair, which varies from a pale grey to a dark brown, spotted with tints of a lighter colour. It is of special interest to zoologists in that it possesses certain intermediate characters between the antelopes and the deer, and it is now placed in a special sub-family. Moschine, of the order Cervidae. It is unique among deer in possessing a gall-bladder, which is found in most of the antelopes. Antlers and horns are absent in both sexes, but, like the muntjac, the male has the upper canine teeth developed into projecting tusks 3 in. or more long. It is a solitary animal, feeding on leaves and flowers of forest shrubs. It is abnormally hardy and sure-footed on the most dangerous ground, being much assisted by the specialised development of the hoofs. Musk occurs as a resinous substance in a gland beneath the skin of the abdomen of the male, and the animals are mercilessly persecuted by hunters. The odour is probably the most penetrating and powerful in nature, and is said to cause haemorrhage in the hunters, when removing the glands, unless they cover their nose and mouth. The glands, after drying for exportation, are known as 'pods.' When they reach Europe they are commonly found to be heavily adulterated.

Muskegon, city of Michigan, U.S.A., and co. seat of same name, on the M. R., 38 m. N.W. of Grand Rapids. Has foundries, paper-mills, and machine-shops, and manufactures motor vehicles and machine-tools. Pop. 47,600.

Musket, see under FIREARMS.

Musketry, military term applied to that branch of work which deals with the theory and practice and regulations concerning small arms: the rifle, carbine, and revolver, and machine guns. The training in the use of weapons is graded from recruit drill, through various range and field practices, to special competitions. The marksman badge, crossed rifles, is awarded for highest efficiency, the 'best shot' having a star in addition. Field practice is very varied, being the development of range practice towards the requirements of M. in actual warfare; it includes company, battalion, and squadron practice, and deals with the tactical use of small arms. A modern development has been the introduction of miniature range-firing with the use of the Morris tube.

Musketry, School of, see SMALL ARMS SCHOOL.

Muskogean Language, see under NORTH AMERICAN NATIVE LANGUAGES.

Muskogheans, see CREEKS.

Muskogee, city and the co. seat of M. co., Oklahoma, U.S.A., 130 m. E.N.E. of Oklahoma city. It is the centre of an agric. and stock-raising region, and yields natural gas and oil. Its manufs. include road machinery, oil-well equipment, and lead products. Pop. 32,300.

Muskoka, dist., riv., and lake of Ontario, Canada, on the E. of Georgian Bay. The first named has numerous lakes intersected by streams, and is a popular resort for anglers. Bracebridge is the cap. The riv. rises in the Nipissing dist. of Ontario, and flows in a south-westerly direction, through the lake, into Georgian Bay. The lake is situated in the middle of the co., and communicates in the N. with Lake Rousseau.

Musk Ox, or **Musk Sheep** (*Oribos moschatus*), animal which, as the generic name implies, has features in common with the sheep and the ox. It is about the size of domestic cattle, and is covered with a dense coat of very long brown hair. The horns of the bulls meet in the middle line of the forehead. The legs are short, but the feet have a large spread, with a footprint much like a reindeer's, and the animals are capable of some speed. They are social in habit, and are now confined to Arctic America, though, at a remote period, they have had a very extensive range, which included Britain. At some seasons of the year they exhale a strong odour of musk, and this pervades the flesh, although it is well flavoured.

Musk Plants. The odour of musk occurs in a number of plants, besides the common musk. The musk mallow (*Malva moschata*) emits the odour when rubbed, especially in hot weather. The musk stork's bill (*Erodium moschatum*) smells strongly of it if handled; but the moschate (*Adonis moschata*) diffuses it from all parts of the plant except when bruised. The musk thistle (*Cirsium nutans*) has a powerful musky scent. The musk orchis (*Hermannia monorchis*) smells like musk at night. A melon (*Cucurbita moschata*), the musk rose, and the musk tree (*Eurybia argophylla*) are among many other plants, etc., which give rise to the odour.

Musk Rat, name given to a number of rodents, and also to one insectivore, which diffuse a musky odour. It most commonly indicates the musquash (*Fiber zibethicus*). Allied to the voles and beavers, the musquash is found in Alaska and Canada. It is specialised for an aquatic life, the toes being webbed, and the long, almost naked tail being sealy and flattened laterally. The head and body together measure about 12 in. Though inclined to be omnivorous, it is chiefly vegetarian, and stores up food for the winter by plastering it with mud into curious structures like haystacks. The musk is secreted by both sexes in a large gland in the groin.

Musk Sheep, see **Musk Ox**.

Muslin, fine cotton cloth, said to have been first made at Mosul (q.v.), a city of Mesopotamia. It resembles gauze in appearance, except that it is woven plain without any twisting of the warp threads on the weft. Some very fine specimens

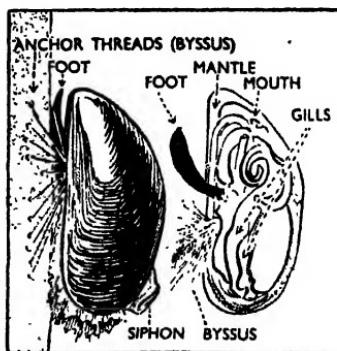
have been produced in India, the Arni M. of the Madras prov. and the Dacca M., made at Dacca, in Bengal, being especially famous. The material is now made in Europe, and numerous varieties are produced. It is used for dresses, curtains, blinds, cushion-covers, etc.

Musorgski, Modest Petrovich, see **MUS-SORGSKY, MODEST PETROVICH**.

Muspratt, James (1793-1866), Brit. manufacturing chemist, and the founder of the Brit. alkali industry, b. in Dublin. After service in the Peninsular war, and in the navy, he began the manuf. of chemical products for commercial purposes. Starting in Ireland with the production of potassium ferrocyanide, he moved to Liverpool, setting up a plant to produce sulphuric acid, and later sodium carbonate. Hydrochloric acid was recovered from the fumes by a process evolved by Wm. Gossage. It was the beginning of the Brit. heavy chemical industry. His son, James Sheridan M. (1821-71), was also a distinguished chemist.

Musquash, see **MUSK RAT**.

Mussel, name for various forms of mollusc, but most commonly applied to the numerous widely distributed Mytilidae. The common M. (*Mytilus edulis*), which forms the familiar wedge-shaped shell, is



MUSSEL

very abundant in Brit. estuaries. While young the Ms. are capable of moving about with the aid of the small brown foot, but later they attach themselves to rocks and to one another by spinning a bundle of tough threads (*byssus*). Though they are even more liable than oysters to pollution, they are important articles of diet in many dists., but they are utilised in greater numbers as bait in deep-sea fisheries. The fresh-water Ms. (Unionidae) are also numerous and widely distributed. The pearl M. occurs chiefly in Scottish rivers.

Musselburgh, tn. and parl. burgh of Midlothian, Scotland, on the firth of Forth, at the mouth of the Esk, 5 m. E. of Edinburgh, of which it has become practically a suburb. M. has extensive

market gardens, and manufs. nets, twine, bricks, tiles, pottery, etc. Here is Loretto School. There are also paper-mills, breweries, tanneries, and salt-works. The tn. is celebrated for its golf links. Together with Craigentinny, Craigmillar, and Portobello, M. forms the burgh constituency of Edinburgh E. and returns one member to Parliament. Pop. 16,900.

Mussel-picker, see OYSTER-CATCHER.

Musset, Louis Charles Alfred de (1810-1857), Fr. poet, novelist, and playwright, b. in Paris. In 1829 he met with great



ALFRED DE MUSSET

success, and at the same time with much hostile criticism, through his pub. of *Contes d'Espagne et d'Italie*. In 1830 his piece, *La Nuit venitienne*, was produced at the Odéon by Blare, but was not well received. In 1832 he left the *Cénacle*, and in the following year pub. *Un Spectacle dans un fauteuil*, which was so far successful that he was asked to contribute to the *Revue des deux mondes*. For this he wrote (in 1833) his fine tragical comedies, *André del Sarlo* and *Les Caprices de Marianne*. His next contribution to the *Revue* was his famous poem *Italia*, written also in 1833, at the beginning of his liaison with George Sand, whom he had met in the summer of that year. Later in the year he left with her for Italy, and returned alone shortly afterwards broken in health and in spirit. The worst side of his moral character was brought out by his sufferings. George Sand gave her account of the catastrophe in a novel, *Elle et lui* (1859), to which de M.'s brother, Paul, replied in his *Lui et elle* (1860). The four *Nuits—de mai, de décembre (1835), d'août (1836)*, and *d'octobre (1837)*—reflect the bitterness of soul and disillusionment which ensued on the breach with George Sand and the ending of the romantic dreams of ideal love which they had

founded on that relationship. His troubles did not prevent de M. from continuing to write. In 1835 he produced *Lucie, Le Chandelier, La Loi sur la presse*, and, more important, *Confession d'un enfant du siècle*, which is of great interest in revealing the poet's complex character. In 1838 he was appointed librarian of the Ministry of the Interior, and two years later his health began to give way. Meanwhile he had written *Lettre à Lamartine* (1836), the comedy *Il ne faut jurer de rien* (1836), *Un Caprice* (1837), some of the *Nouvelles* (1837), and the fragment *Le Poète déchu* (1839). In 1840 he wrote *A trente ans*, and in the following year the spirited poem *Le Rhin allemand*. His latter years were comparatively unproductive, his works including *Il faut qu'une porte soit ouverte ou fermée* (1845); *Bettine* (1849); and *Carmosine* (1851). He was elected to the Academy in 1852, and d. of heart disease five years later. Alfred de M. was, above all, a lyricist, whose one dominant theme was love in its varied manifestations. All his work is markedly subjective. Beginning life as an enthusiast, he early experienced a sad disillusionment, owing chiefly to his unhappy liaison, and his later work is characterised by a melancholy which is preoccupied with the darker problems of life and ends by wooing a despair which sees in its bitter-sweet memories the only thing worth having experienced. Complete eds. of his works have been pub. by P. Leucerre (1876), E. Biré (1907-8), and M. Alem (1933-38), letters by L. Seché (1907), and a bibliography by M. Clonard (1883). See studies by C. F. Oliphant, 1890; Arvede Parino (*Mme Vincens*), 1893; L. Seché, 1907; E. Henriot, 1929; H. O. Sedgwick, 1932; and M. Alem, 1910; also Spoelberch de Lokerjau, *La Véritable Histoire de Elle et Lui*, 1897; and P. Castinal, *Le Romantisme de Musset*, 1933.

Mussolini, Benito Amilcare Andrea (1883-1945), 'Duce' or dictator of Italy; b. at Varano di Costa, by Dovia, com. of Predappio, prov. of Forlì; elder son of Alessandro Giuseppe M., blacksmith, atheist, and Socialist agitator, and later an inn-keeper and Rosa Maltoni, devout, simple-minded Catholic, who kept a one-room school at their home. Alessandro named his first-born after Benito Juarez, the Mexican revolutionary, Amilcare Cipriani, the Romagnole anarchist, and Andrea Costa, a Socialist. M. attended an elementary school at Predappio, and, later, the Salesian school at Faenza. The Ms. were, according to Eng. standards, extremely poor and lived in a two-room tenement on an upper floor of an old house which is said at one time to have been a palace. M. worked for a time at his father's smithy. He then completed his education at the Royal Normal School of Forlimpopoli, a school for training elementary school-teachers, and was for a year a teacher at Gualtieri, Reggio nel' Emilia. In 1912 conscious of himself as a misfit and anxious to avoid military service, he went to Switzerland; he worked as a mason, translated, starved, made revolutionary speeches, and was arrested

at Lausanne for vagrancy, but was befriended by Socialist organisations. Almost ignorant of the theoretical basis of Socialism, he yet developed into a formidable controversialist and was encouraged by Serrati, the well-known It. Socialist, and by Angelico Balabanoff, the colleague of Lenin. Meanwhile his father had been jailed for instigating the tampering with ballot boxes. In June 1903 he was expelled from the canton of Berne for revolutionary activities, and later in that year the news of his mother's illness caused his return to Forlì. After successfully evading the conscripts' draft by falsifying his passport for Geneva, he returned again to Italy and served in a Bersagliere regiment in 1905-6. At the end of his military service he took a post as a teacher of Fr. at Oneglia, near Genoa, and at the same time conducted atheistic propaganda in the local Socialist newspaper. He then tried his hand at literature, writing, among other things, a flamboyant novel, *Claudia Particella* (trans. into Eng. as *The Cardinal's Mistress*, 1929). He was expelled in 1909 through offending the local clergy. In the following year he founded *La lotta di classe* ('The Class Struggle'), a weekly paper, at Forlì, using it as a medium for incitement to violence, attacks on the Church, denunciation of the monarchy, and gibes at nationalism in the manner of Hervé, all views which later, as a Fascist, he quickly jettisoned. He suffered imprisonment for his articles, but at the end of 1910 he became secretary to the Socialist Society at Trent, then an Austrian possession. He voiced his inherent irredeemability in the Socialist paper *Il Popolo* and was banished by the Austrian authorities (Oct. 1911). He was next heard of as editor of the famous Socialist paper of Milan, *Aranti!* Up to the First World War he had been an extreme Socialist, using extremism as a lever by which to dislodge the moderate Socialist leaders and secure place and office for himself. At the outbreak of the war he advocated neutrality, and his sudden conversion to intervention on the Allies' side resulted in his expulsion from the Socialist party at a congress in Milan (Nov. 1914). The explanation of his swift conversion is generally sought in the activities of the Fr. Socialist deputy, Marcel Cachin, who probably told M. that his dream of owning a newspaper of his own might be realised through Fr. gold provided he advocated intervention.

His expulsion by the Socialist Congress at Milan was the turning-point in his career. All his old associates abandoned him in disgust; but M. was now the powerful owner and editor of a paper, for on Nov. 15 he had founded *Il Popolo d'Italia*. In April 1915 he was arrested in Rome for the violence of his interventionist campaign and fought a duel with the moderate Socialist leader, Claudio Treves. When Italy declared war (May 1915) M., who could have claimed exemption as an editor, volunteered as a common soldier in the 11th Bersaglieri regiment, who fought at the Carso. He

spent only five weeks in the trenches, sending back to the It. press sev. photographs of himself 'in the front line.' He served with the rank of corporal, his service ending on Feb. 23, 1917, when he was injured through one of his own mortars misfiring in exercise behind the lines. In Sept. he resumed editorship of his paper, its chief use now being to combat pacifism, and for this purpose he collaborated with the *Fasci di Resistenza*, or 'Unions of Resistance,' organised for that specific purpose. With the war ended, the exceptional disorder that reigned in Italy favoured the growth of the strong counter-revolution M. had been preparing. He had now decided to form his own political group and to that end held a meeting in March 1919, in rooms lent by a wealthy Milanese Jew overlooking the Piazza San Sepolcro—whence at first his group were known as *Sansepolcristi*. The group subsequently adopted the name *Fasci Italiani di Combattimento*, the term 'Fasci' being already in familiar use. Thus on March 23, 1919, the *Fascismo* institution was founded; its activities, which were directed by M., are recorded under FASCISM. M. very soon dropped the original programme of the group, which seemed indeed to advocate the abolition of almost everything for which Fascism has subsequently stood. He found a much surer way to power through D'Annunzio's expedition to Fiume and opened a subscription list in his paper for the expedition. It was the blackshirts of D'Annunzio's *arditi* and their slogans, and also the gangster methods of their leader, that appealed so strongly to M. When, however, Fiume was bombarded M. did not, as was expected, move to D'Annunzio's assistance. He had in fact betrayed D'Annunzio at the instance of the new Prime Minister, Giolitti, who undertook for his part of their mutual bargain secretly to arm the Fascist bands. A state of guerilla warfare now raged throughout Italy. Fascist propaganda has always spread the legend that in the years 1919-22 Italy was in a state of revolutionary Bolshevism from which she was delivered by the leadership of M. But in fact Italy was in no real danger from Bolshevism, and when the workers locked themselves in the factories, M. gave his approval to their move. He was in fact prepared to support any one who would support him, and in May 1921 he actually made overtures for a truce with the Socialists and, as suddenly, veered round to the Monarchists. The wealthy industrialists and landowners saw in him a man who could be used as their tool in the same way that the German industrialists sought to use Hitler. They became M.'s patrons, but were to find that, having adopted him, he became their master. He now pursued the familiar role of the political gangster, his first exploit in this kind being the so-called 'march on Rome.' In this coup d'état M. was the third choice of the duke of Aosta and other generals who had come to the conclusion that the weak gov. under Facta must be changed. Both D'Annunzio and Gen. Peppino Garibaldi refused to

lead the 'revolt.' M. accepted the offer and held a Fascist congress in Naples (Oct. 24-26) at which he declared that the Fascists would assume power by force. But he took care to leave the march on Rome to be organised and carried out by others, he himself travelling to Rome by sleeping-compartment. The marching columns met with no opposition whatever, and eventually fewer than a large div. actually approached the cap. (Oct. 28). Faenza wished to declare a state of siege, but the king, his resolution undermined by the attitude of his kinsman, the duke of Aosta, first gave, and then withdrew, his approval. Had he agreed the regular troops under Badoglio (q.v.) could have dispersed the Fascist march in a few minutes. In the result Faenza resigned and M. formed a coalition ministry with himself as Prime Minister, foreign secretary, and minister of the interior. But though so far he followed a conventional policy, humouring both king and church, he took care to convert his illegal armed bands into the legal Fascist militia and thereafter incited them to a course of violence. The notorious murder of Giacomo Matteotti (q.v.), the Fascist gov.'s ablest critic, a few days after he had launched a brilliant attack in the Chamber on the Fascist chiefs, rocked the Fascist regime to its foundations; mutual recriminations followed and the Fascist chiefs, furious at M.'s dishonest repudiation of responsibility, now tried to compromise M. by publishing revelations in the press. The political stock of the Fascists now sank very low. M. and his Fascists could even now have been overthrown had there been among the opposition a single man capable of resolution and leadership. But M. regained his prestige through a fortuitous visit to Rome by Austen Chamberlain on a mission of goodwill, apart from the fact that his party secretary Farinacci was quite prepared to continue gangster methods on still more thorough scale. M. himself escaped three attempts at assassination about this time (1925), but gradually he succeeded in transforming Italy into a totalitarian state (q.v.) with himself as dictator. The chief instruments in this process were the secret police and propaganda. M.'s remedy for Italy's unstable economic condition was to follow the path of autarky (q.v.) or economic self-sufficiency, a policy which is generally doomed to frustration and succeeds only in a country which does not depend largely on other countries for its essential raw materials. M.'s autarkic policy inevitably led him to seek colonial expansion and eventually to embark on his aggressive policy against Ethiopia. He had not been long in power before finding that the Catholic party were among his chief opponents. He now deemed it polite to forget his crude atheism and to follow a policy of conciliation towards the Church. Thus he made a gift of the very fine Chigi collection of books and MSS. to the Vatican; hence too the inclusion of the mass in public ceremonies and the restoration of the crucifix to the schools. M. even sub-

mitted privately to having his marriage blessed. His union with Rachele Guidi, who worked in his father's tavern, began irregularly in 1910; later, during the First World War, he went through a form of civil marriage with her. These scr. advances having met with some encouragement, M. now embarked on a solution of the fifty-year-old problem, the Rom. question, i.e. the problem of the relations between the State and the Vatican. The ensuing negotiation resulted in the Lateran Treaty and Concordat (Feb. 1929), by which the papacy gave up its claim to the former papal dominions, retaining unrestricted sovereignty over a small area of Rome thenceforth known as the Vatican City and receiving compensation in a large amount in cash and securities. M.'s dominant motive in concluding these



EN A
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accords with Pius XI. was to bring the Church within the orbit and, as far as possible, the control of the totalitarian state, to enlist the support of the strongest and oldest force in the country, and to win the applause of Catholics all over the world. For religion he cared nothing. Even when he visited the pope in 1932 he did not perform the customary obeances. Soon afterwards he was making parallel overtures to the Muslims, posing as the champion of Islam with the same access of fervour as he had shown in kissing the gospels. To further his aggressive designs on Ethiopia, and indeed generally, he replaced Grandi by his son-in-law, Count Ciano, an utter nonentity. He had gradually relegated his other rivals to obscurity. Thus De Vecchi was sent to the Dodecanese as governor. Balbo (q.v.) was conveniently removed before he could bring to maturity his project of granting Libya independence, and Badoglio w. "deprived of all influence in Fascist circles." M., always contemptuous of legislative assemblies and cabinet gov., not only assumed office as Prime Minister, but took over the three service

ministries and the Ministry of the Interior, while putting the Foreign Office under the puppet, Ciano.

Thus Italy's policy became essentially that of M. himself; but, with the rise of Hitler in Germany, his path became beset with ever-increasing difficulties. Faced with the alternative of giving up his aggressive dreams or supporting Hitler, he paid the heavy price involved in the latter choice. This included the abandonment of It. influence in Austria, which had become almost a satrapy of Italy. There were angry meetings between the two dictators in 1934, and later, when Hitler seemed to be preparing to march on Austria, M. massed his troops on the Brenner Pass. Nothing decisive happened at that time, but in 1936 M.'s diplomatic position had weakened as a result of his Ethiopian policy, which had estranged both Great Britain and France. But making the best of both worlds M. joined Hitler in that year in supplying Franco with arms and men against the Sp. Republicans and so became a member of the Axis (*q.v.*) and a partner in the anti-Comintern Pact (*q.v.*). When therefore in 1938 Hitler actually marched into Austria, M. held aloof and, in the following year, the Berlin-Rome Axis became the so-called 'pact of steel.' In June 1940, with France approaching military collapse and the prospect of Great Britain's isolation, he declared war against both, hoping, 'like a jackal' (Mr. Churchill's description), to secure a cheap reward in the appropriation of Tunis, Cannes, and other portions of Fr. ter. It was the famous battle of Britain (*q.v.*), however, that offered the first check to his career as to that of his fellow dictator, and in the course of the next two years he found himself at war with both Russia and the U.S.A. as well as with Britain, while the jealousy and ambition of Hitler, who soon became master of Italy after the It. debacle in Libya and Greece, precluded any possibility of Fr. spoils for Italy.

With the loss of It. E. Africa M.'s prestige began to wane even more sharply than before his visit to Salzburg, which involved sending It. troops to uphold Hitler in his anti-Communist crusade. Mr. Churchill's speech on Nov. 29, 1942, inviting the world to realise that 'one man, and one man alone, has brought them (*i.e.* the Italians) to this pass,' was an implicit appeal to the It. people to overthrow M., and indeed the creation in Dec. 1942 of a new Fascist directorate, which was to look more particularly to the home front, was regarded as an indication of internal danger in Italy. The plight of Italy became aggravated in early 1943 with the threat of invasion. By the end of March M. sought to strengthen his control by reorganising the party directorate and by demanding a personal pledge of loyalty from all party leaders. But with the fall of Tunisia the situation grew steadily worse. In March Hitler demanded the aid of It. troops to relieve Ger. garrisons in France and the Balkans; but M. needed all his military strength at home now that he had lost one army in

Africa, besides the better part of ten divs. roughly handled on the Russian front. In his vain attempt to throw some glean of light on a darkening horizon M. could only promise that Italy would yet return to Africa, a hollow boast that could hardly conceal the fact that the It. Gov. expected an invasion and had no hope of defeating it; and even the alternative of a peace based on the acceptance of unqualified defeat seemed out of reach while Kesselring's Ger. armies were arrayed in grim resolution on It. soil. In July the It. military authorities called for massive Ger. aid as the only hope of saving Italy. This new request drove Hitler to extreme recriminations against his fellow dictator, and the only course left to M. was to concentrate on defending the Po valley and to leave the rest of Italy to its fate. Soon after M.'s report to the Fascist Grand Council of the outcome of his meeting with Hitler, Grandi, with the dubious support of Ciano, Bottai (an ex-minister of education), and Gen. de Bono (the general who had been superseded in Ethiopia), led a revolt against him, and a demand for M.'s resignation, expressed in Grandi's motion that the king be invited to assume command, was carried by nineteen votes to seven. On July 25 M. was summoned to the royal palace, informed of his dismissal, and taken into custody as he left. His fall meant the end of the Fascist regime. The king took command of the army, Badoglio (*q.v.*) was entrusted with the formation of a new gov., and throughout Italy spontaneous demonstrations bore witness to the relief felt by the people at the loosing of the Fascist bonds, a release as yet more apparent than real. M. would certainly have been lynched had he appeared in the streets of Rome. He was conveyed by a strong force of carabiniers to a military barracks. He was several times transferred from one place of detention to another and eventually to a clinic on the Campo Imperatore, near Aquila, in the Abruzzi Mts. It was from here that he was carried off in a daring raid by a strong Ger. parachute force. M. in Nazi hands became, as was no doubt intended by Hitler, a potential rallying point for the endangered Fascists, who had everything to lose from a change of regime or an allied victory. M. set up a Fascist republic in the N. of Italy and early in the ensuing year (1944) Count Ciano was tried by a Fascist tribunal for his part in the overthrow of his father-in-law and shot. But gradually and inexorably, with the defeat of the Ger. armies in Italy, the partisans in the N. of Italy secured almost complete control of the situation, and M., now a sick man, tried to escape across the frontier into Switzerland. But he was betrayed to the partisans and arrested on April 28, 1945, and, together with some twelve members of his ex-Fascist Cabinet and his mistress, was executed by partisans, who carried the bodies of their victims to Milan for public display.

It has been well said that if M. sought a model for himself he could have found it

in the character of the tyrant as delineated by Plato or Savonarola and that nearly everything in his movement was borrowed from D'Annunzio. Though neither a deep nor original thinker, he acquired a hold over the It. people by the guns of his illegal bodyguard, the support of the army chiefs, big industrialists, and land-owners, the most unscrupulous propaganda and flamboyant oratory. As a political showman his only rival was Hitler. His personal vanity was almost boundless, as might be gathered from the Cesarean mien and jutting jaw, and the equally studied concealment of his shortness of stature, baldness, and generally plebeian appearance. His issue, by his wife Rachele, numbered five. His eldest son Bruno was killed in the Second World War, and in M.'s memorial book, *I Talk with Bruno*, there are occasional gleams of paternal sentiment. His one brother, Arnaldo, for whom he seems to have entertained a genuine affection, pre-deceased him. His daughter Edda, the Countess Clano, is said to have exercised a corrupting influence over his policy.

There is a copious bibliography on M. and Fascism and most books, being written either to extol or to condemn, must be read with reserve. See his *My Autobiography* (trans. by R. W. Child, 1928); C. Salvemini, *The Fascist Dictatorship*, 1928, and *Under the Axe of Fascism*, 1936; G. Megaro, *Mussolini in the Making* (to 1914), 1928; A. de Ambris, *Mussolini: la leggenda e l'uomo*, 1930; H. Finer, *Mussolini's Italy*, 1935; Margherita Sarfatti, *The Life of Benito Mussolini* (with a preface by him); trans. by F. Whyte, 1930; G. Seldes, *Sauvage War, the Untold History of Mussolini and Fascism*, 1936; E. Lussu, *Enter Mussolini: Observations and Adventures of an Anti-Fascist* (trans. by M. Rawson, 1936); J. A. R. Marratt, *Makers of Modern Italy*, 1937; Angelica Balabanoff, *My Life as a Rebel* (comments on M.'s days in Switzerland), 1938; G. Pini, *Official Life of Benito Mussolini* (trans. by L. Villari), 1939; I. Thomas, *Who Mussolini Is* (Oxford Pamphlets on World Affairs, No. 59), 1942; M. H. Macartney, *One Man Alone*, 1944, and *Memoirs of Mussolini*, 1942-43, 1946; P. Soperito, *Empty Balcony*, 1947, *Mussolini's La Mia Vita*, 1947 (his early life to 1912), and (Eng. trans.) *The Fall of Mussolini*, 1948; and E. Amleucci, *I 600 Giorni di Mussolini*; also M. Muggeridge (ed.), *Ciano's Diary*, 1917, and *Ciano's Diplomatic Papers*, 1948.

Mussooree, tn. and sanatorium of the United Provs., India, 130 m. N.N.W. of Rampur. Pop. 8000.

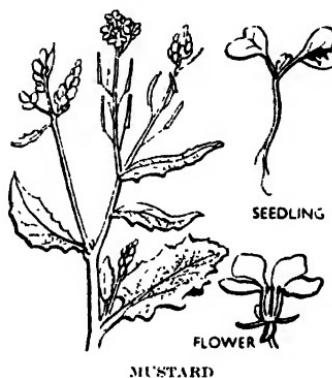
Mussorgsky, Modest Petrovich (1835-1881), Russian composer, b. at Karevo, Pskov, was at first a guards officer. In 1857 he began to study music under Balakirev (q.v.) and in 1858 resigned his commission, becoming a civil servant. A sympathy with common folk led him to write realistic songs, following the inflections of their speech, and he endeavoured to do the same with his operatic characters. His life became

more and more poverty-stricken; he took to drink, and d. from a spinal disease. The influence of folk-music upon his work was strong, especially in his sixty songs. His chief operatic work was *Boris Godunov* (1874) from Pushkin, and his other best-known works are *Night on the Bare Mountain*, for orchestra, and the suite, *Pictures at an Exhibition*. See M. D. Calvocoressi (ed. by G. Abraham), *Mussorgsky (Master Musicians)*, 1946.

Mustagh, see KARAKORUM MOUNTAINS.

Mustapha Kemal, see ATATURK.

Mustard. The two Ms. of importance are black, brown, or red M. (*Brassica* or *Sinapis nigra*) and white M. (*B. or S. alba*). The former is grown in Cambridgeshire and adjoining cos. for the production of seeds, which are ground, and



MUSTARD

after removal of the dark-coloured testas are used as a condiment or are converted into M. oil. The white M. seedlings are commonly used in salads, and for the purpose should be sown three days after creas, with which it is usually eaten.

Mustard Gas (dichloroethyl sulphide, $(\text{CH}_2\text{CH}_2\text{S})_2\text{Cl}_2$, *Yperite*, *Yellow Cross*) was obtained by Richie, 1854, by the action of chlorine on ethyl sulphide. It was described by Guthrie, 1860, and prepared pure by Victor Meyer, 1886, by the action of ethylene chlorohydrin on sodium sulphide, followed by the action of hydrochloric acid. It was first used as a poison gas in the First World War by the Germans, July 12, 1917. It is a light yellow, oily liquid boiling at 215°C . and solidifying at 14°C . It is a powerful vesicant (blister producer), and affects the eyes and respiratory tract after a period during which the effects are not obvious. It was manufactured in 1918 by the action of sulphur chloride, S_2Cl_2 , on ethylene at 30°C .

Mustique Island, see under ST. VINCENT.

Mut, Egyptian goddess, mother of the gods, and wife of Ammon or Ammon-Ra (q.v.). She was the great 'world-mother,' generally figured with a vulture head-dress, the vulture being the emblem of maternity. Sometimes she is given with

the head of a lioness, or additional ones of a vulture or lioness.

Mutina, see MODENA.

Mutiny Act. The first Mutiny Act, that of 1689, made it possible to keep a standing army in time of peace, not only by sanctioning its existence for the first time in England, but by providing for the punishment of mutiny and desertion with death, and empowering the Crown to commission courts-martial to deal with those offences in time of peace. From 1689 Parliament passed the Mutiny Act annually until 1881, when it was finally superseded and merged in the Army Act of that year, an Act which is also annually renewed. The Jacobite Rebellion of 1715 made it necessary to increase the stringency of the Crown's disciplinary powers, and accordingly the Mutiny Act of 1715 authorised the Crown to formulate Articles of War to regulate generally the forces in the United Kingdom in time of peace. Prior to that year the Crown could only issue such articles in times of war or rebellion. Among other things, the later Mutiny Acts provided for the punishment by courts-martial of persons guilty of embezzling military or naval stores. See Sir C. G. Robertson, *Select Statutes, Cases and Documents illustrating English Constitutional History, 1660-1932* (7th ed.), 1936.

Mutiny, Indian, see INDIA, *History*.

Mutsuhito (1852-1912), known as *Meiji Tenno*, 122nd emperor of Japan, b. at Kyoto. He succeeded his father Komei in Jan. 1867. Before he was crowned radical insurgents from the S. seized his person on Jan. 3, 1868, and so overthrew the power of the Shogun. There followed the amazingly rapid modernisation of Japan, with a constitution modelled on the Brit. M. had but little personal hist.

Mutterstadt, com. and tn. of Germany, in the Rhine and Palatinate (formerly Bavaria), 6 m. S.W. of Mannheim. Pop. 5000.

Muttia, or *Muthura*, name of a dist. and tn. in the Agra div., United Provs., India. The dist. has an area of 1445 sq. m. and a pop. of 807,000. The tn. lies on the r. b. of the Jumna, and is the centre of Hindu devotion. Pop. 76,720.

Mutualism, see SYMBIOSIS.

Muyrcia Language, see under SOUTH AMERICAN NATIVE LANGUAGES.

Muycas, see CHIBAS.

Muzaffargarh, dist. of the Multan div., W. Punjab, Paki-tan, covering an area of 5603 sq. m. Wheat, rice, pulse, and indigo are the chief crops, and large herds of camels graze upon the sandy waste. Pop. about 712,800. The chief tn. bears the same name, and lies on the r. b. of the Chenab, 20 m. S.W. of Multan. Pop. 8200.

Muzaffarpur, dist. in the Patna div. of Bihar, India. It was at one time included in W. Bengal, but the boundary of the latter was altered in 1912. M. is bounded on the N. by Nepal, on the E. by Darbhanga (also a dist. of Bihar), and on the W. by the dists. of Saran and Champaran. The dist. was originally formed in 1875 out of the great dist. of

Tirhut, which up to then was the largest and most populous dist. of lower Bengal, then the new dist. of M. being made up of M., Hajipur, and Tajpur. Area 3035 sq. m. Pop. (1910) 2,754,700; (1941, estimated) 3,000,000. The tn. of M. is the headquarters of the dist. magistrate and collector. It has many broad streets, a courthouse, good schools, including a technical institution, and a jail. It is liable to inundation, and to prevent the riv. from reaching it an embankment has been thrown across the lake towards Daudpur; but in spite of this the riv. has cut deeply into the high bank near the court-house, and unless it changes its course it will probably in time break through the strip of land which now separates it from the lake. Pop. 51,000.

Muziano, Girolamo (1528-92), It. painter, b. at Aquafredda, and studied under Romanus. It was not until 1550, when he went to Rome, that he began to be noticed.

His most famous work is 'The Resurrection of Lazarus,' which was

finally placed in the Quirinal Palace. The large fortune which he left was used to

in founding the Academy of St. Luke at Rome, where he d.

M.V.D., secret police of Soviet Russia, successor of the Cheka, G.P.U., and N.K.V.D. (People's Commissariat for Internal Affairs). The operations of M.V.D. permeate every phase of Russian life. Its organisation includes armed troops, tanks, and aircraft, plain-clothes men, and part-time informers. It controls the labour camps and against its acts and decisions there is no appeal. It is under the control of Ministry of State Security.

Mweru, see MOERO, LAKE.

Mycelium, see under FUNGI.

Mycene, one of the oldest cities of anat. Greece, was situated in a very strong position on the hill overlooking the N. extremity of the Argive plain. In 468 B.C. M. was dismantled by the people of its anct. enemy Argos, and was never rebuilt. In the time of Pausanias the ruins consisted of a great part of the walls, with the gate called that of the Lions, from lions being sculptured above it, said to be the work of Cyclopes; the fountain called Persæ; and the subterraneous buildings of Atreus and his sons. The discoveries which have been made here have greatly increased the knowledge of Gr. art, especially pottery. The museum at Athens contains many specimens.

Mycenæan Civilisation. This general term was first applied to the prehistoric civilisation discovered at Mycæne, Troy, and Tiryns by Heinrich Schliemann in 1876. Since then so much has been discovered and laid bare by archaeologists that the word Mycænean is now scarcely appropriate, for the main source of this civilisation apparently radiated from Minian Crete, and therefore the present accepted name of 'Aegean civilisation' embraces more fully the breadth and depth of the great culture of which Mycænean was an offshoot. Homer sang of great cities, of palaces peopled with civilised men and women, of battles and heroic deeds which

until the year 1870 had been merely myths and glorious legends. In that year Schliemann set out to find the site of Troy, and to prove that Homer had some foundation for his historic poems. No site in the Troad can really be placed accurately with Homer's Troy, but the ruinous mounds of Hissarlik, which have been thoroughly explored, first by Schliemann and continued after Schliemann's death by Dr. W. Dorpfeld, are accepted as the original site of famous Ilium. Schliemann dug with faith and enthusiasm, but without the scientific skill of the modern archaeologist. He reached his second stratum in 1873 and revealed a burnt city, with treasures of gold and silver and bronze that suddenly aroused the interest of all students of ancient history. This find assisted in proving that the Homeric legend of Troy was not founded only on myth, but that a great and wonderful civilisation flourished at least 1500 years before the starting point of Greek history, as given by Grote and others. Schliemann next excavated Mycenæ. Here were found relics of a civilisation which acts as a link between that of Crete and the Greeks; the evidence suggests that a sudden introduction of Cretan civilisation took place. The belief that the tomb of Agamemnon lay within the gates of the citadel caused him to dig a pit some 100 ft. sq., about 40 ft. from the great 'Lion gate'; stone slabs were first unearthed, then a circular altar with steles carved in relief. Three feet below the altar lay the first of the five shaft graves, hewn from the rock. The roofs had collapsed, and buried with the bodies beneath the debris was a remarkable treasure. Gold masks, head-bands, breast-pieces, rings, pendants, daggers, and sword hilts, also objects of ivory, amber, silver, and bronze; sixty swords and daggers were found in one grave alone. Schliemann was convinced that these were the actual graves seen by Pausanias, containing Agamemnon and his household. Whether that is true or not we cannot prove; what was proved was the excellence of the metal work and other treasures, showing a highly advanced civilisation belonging to a wealthy prehistoric people. It is possible that this shaft-grave dynasty was established by some great family coming from Crete, bringing Minoan (Cretan) civilisation with them. The beehive tombs were explored next, the largest being the well-known treasury of Atreus; it was strongly built, with a passage leading to a high vaulted chamber shaped like a beehive. The door to the chamber was 17 ft. high, bordered with columns carrying a cornice masked with red porphyry, with spiral decorations, enriched with bronze and coloured marble ornaments; rich decorations were visible everywhere showing a high excellence in art. A tomb not far from the treasury of Atreus that Schliemann explored, and believed to be the grave of Clytemnestra, showed beautiful designs in green alabaster and coloured marbles. From Mycenæ he went to Orchomenos in Boeotia, and here other excavations showed the same rich

art and good workmanship, influenced by Egyptian art. Later at Tiryns his work laid bare the entire plan of a citadel palace, with towers, galleries, sleeping apartments, and living-rooms. A frieze of alabaster carved in rosettes and inlaid with vivid blue paste was found, also excellent fresco painting. After Schliemann's death Dorpfeld and others continued his work. Mycenæ was still considered to be the chief home of this great culture until Crete was explored.

Crete disclosed a period of civilisation belonging legitimately to the whole Aegean, scarcely less ancient than that of Egypt. The untiring work of Sir Arthur



Ashmolean Museum

FACSIMILE OF DAGGER INLAID
WITH GOLD LILY PATTERN
FROM MYCENAE

Evans has discovered for us the interesting conditions of art and architecture belonging to the Minoan periods. The principal excavations in Crete have been at Knossos, Tylos, and Hagia Triada (see CRETAN). It was here that this Aegean civilisation apparently found its fountain-head. For the general evidence of this culture there are ruins of palaces, villas, houses, and beehive graves; the decorations and architectural features are columns, friezes, mouldings, various mural paintings, and mosaic inlay, etc. Vessels have been found, from tiny pots to huge stone jars, and quantities of pottery. One of the general features of Mycenaean pottery is the stirrup-cup or false-necked vase, so-called from the fact that the neck to which the handles join is closed, or false, and another neck is fashioned further away from the handles for convenience in pouring out. These occur wherever this great culture has been brought to light,

and are the typical pottery of that period known as Late Minoan III. (Crete).

Many fragments of Cretan pottery have been discovered in Egypt, and it seems probable that a considerable trade may have been carried on between the countries. Mycenaean objects have been found in Sicily and Spain, and there were colonies on the Syrian and Turkish coasts. Large quantities of amber from the Baltic show the extent of trade. The two famous Vaphio cups, discovered in 1889 by Dr. Tsountas, were found in a beehive tomb; they were among many beautiful articles of gold, silver, bronze, crystal, etc. The cups were of gold, decorated in relief with scenes depicting the capture of bulls; they belong to the Late Minoan I. period, and represent a triumph of ancient art. Thrones, seats, and tables in stone and terra-cotta have been found, objects of art in ivory and precious metals, small sculptured works, but no large ones. Jewellery of various kinds, weapons in metal, only a few later ones being of iron, engraved gems and gem impressions. Tombs of pit or dome-shaped style were also found, paved roadways with bridges and an excellent system of drainage, and, lastly, two main systems of script which as yet remain undeciphered. The deity was a mother-goddess, both in Crete and Mycenae, her symbol of the double-axe being frequently discovered in excavations. The dead were not burnt, but buried with great honour, apparently with the hope of a future life; there was possibly a hero-cult of the dead. The social organisation indicates a considerable body of law and a luxurious ruling class. Tradition asserts that Minos was a great lawgiver, and that he possessed a great navy which guarded his commerce with other countries. From the finds of Aegean pottery and various objects in other lands it would seem probable that they traded with Egypt and N. Africa, with Sicily and Italy, and even as far as Spain. The total duration of this great civilisation covers at least 3000 years. Apparently with the use of iron the Aegean culture ended, about 1000 B.C.

The M. C. came to an end as abrupt as its beginning, with the Dorian invasion from the N., about 1000 B.C. After a dark age until the eighth century B.C., Athenian civilisation arose, rooted in the Cretan civilisation through the link of Mycenae. See H. Schliemann, *Mycenæ*, 1878; G. Rodenwaldt, *Der Fries des Megarion von Mykene*, 1921; M. P. Nilsson, *The Minoan-Mycenean Religion and its Survival in Greek Religion*, 1927. The *Mycenaean Origin of Greek Mythology*, 1932, and *Homer and Mycenæ*, 1933; and A. B. Wace, *Antiquity*, 1913; also for Cretan civilisation in its later period, i.e. the so-called Mycenaean period, see Sir A. Evans, *Prehistoric Tombs of Knossos*, 1906; *The Palace of Minos*, 1921; and 'Knossos and Mycenæ,' address to the International Prehistoric Congress in London, Aug. 1932.

Mycetozoa, see *MYXOGASTRES*.

Mycoderma, in botany, the ferment fungi which form a thin film on the surface of

liquids, as wine, on which a film is created by *M. rini*, and vinegar, by *M. aceti*.

Mycological Institute, Imperial, see **IMPERIAL MYCOLOGICAL INSTITUTE**.

Mycology, science of fungi (see FUNGI) or the study of plant disease. The Imperial Mycological Institute at Kew co-ordinates information on plant diseases with the work on insect pests of the Imperial Institute of Entomology and that of the various Imperial agric. bureaux located at research stations. All these bodies came in 1934 under the control of the joint executive council, which since 1928 had regulated the other bureaux.

Myddleton, Sir Hugh, see **MIDDLETON**.

Myleitis, inflammation of the spinal cord; osteomyelitis is inflammation of bone-marrow. If the grey matter of the spinal cord is affected, the disease is called poliomyelitis (infantile paralysis); if the white matter, leucomyelitis. In acute M. the nervous tissue undergoes degeneration, but may be partially reintegrated; in chronic M. the nervous tissue becomes hardened and overgrown with fibrous connective tissue. The symptoms vary according to the seat of the lesion. Hyperesthesia, or excessive sensibility, is at first apparent about the level of the lesion; but later sensibility is numbed, and the parts below the lesion pass into paralysis. The progress of the chronic form is slow; little can be done except to look after the comfort of the patient, and he may linger for years or be cut off by some intercurrent disease. The cause of M. may be injury or secondary inflammation from meningitis.

Myers, Frederic William Henry (1843-1911), Eng. essayist, poet, and author, b. at Keswick. He was appointed classical lecturer at Cambridge. M. was the leading spirit, with H. Sidgwick, R. Hodgson, R. Gurney, and F. Podmore, in founding the Society for Psychical Research in 1882. *Phantasms of the Living* (1886) was the result of some of his labours. His most considerable work in that sphere, however, was the posthumous *Human Personality and its Survival of Bodily Death* (2 vols., 1903), which, although incomplete and tentative, was the first attempt to connect the phenomena of hypnotism, mediumship, trances, hallucinations, etc., as belonging to one and the same field of inquiry. His other works include *Catholic Thoughts* (1873); *Essays Classical and Modern* (1883); *Science and a Future Life* (1893), etc.

Myitkyina, most northerly dist. of Upper Burma, Mandalay div., 10,640 sq. m. in area. Indawgyi Lake is in the S.W. The tn. is the limit of navigation on the Irrawaddy, and the terminus of the railway running N. from Mandalay. It was lost to the Jap. invaders early in 1942. In March 1944 it had become the immediate goal of the allied counter-offensive, their troops being by then firmly placed across the main routes by road and rail and riv. linking M. with its supply bases in the S. By the end of April Gen. Stilwell's forces were within 40 m. of M., though they met with tenacious Jap. resistance. On May 17, after a forced march

over 110 m. of mt. and jungle in twenty days, an Amer. force under Gen. Merrill suddenly descended on the airfield 2 m. S. of M. and wrested it from the surprised defenders. The Jap., however, still clung to M., and it was not until Aug. 3 that the tn. was finally taken, following a siege of two and a half months. Pop. 70,000. See further under BURMA, SECOND WORLD WAR, CAMPAIGNS IN.

Mylae, see MILAZZO.

Mylitta, the name of a goddess of Babylonian and Assyrian mythology.

Mylonite, rock formed by the grinding and shearing of the rocks of the earth's crust under the forces of intense earth movements. Ms. occur in the N.W. highlands of Scotland.

Mymensingh, **Maimansingh**, or **Mymunsingh**, dist. of E. Bengal, Pakistan, on the borders of Assam, and bounded on the W. by the Brahmaputra. The cap. is Nasirabad. Area 6287 sq. m. Pop. about 4,000,000.

Myna, or **Crackle**, genus of birds of the starling tribe, having dark-brown plumage, with white markings on tail and wings.

Mynyddisilwyn, urb. dist. of Monmouthshire, 8 m. from Newport and Pontypool. It is on a coal-field and has chemical and tinplate works. Pop. 12,000.

Myogen, see MYOSINOGEN.

Myopia, or **Short-sight**, defect in vision due to a faulty structure of the eye. Parallel rays of light are brought to a focus in front of the retina owing to an excessive length of the eye or the surface of the cornea and a too great convexity of the crystalline lens. Thus an indistinct image is thrown on the retina. This defect is corrected by the use of spectacles with concave lenses. The concavity of the lenses is adjusted so that parallel rays are focused on the retina as in ordinary vision. M. often has hereditary connections, and children of myopic parents should have regular examination of their eyes during the average age of inception (nine to eleven years).

Myosinogen, or **Myogen**. M. and paramyosinogen are the two soluble proteins present in muscle in the proportion of 4:1. They are of globulin nature and readily coagulate through heat. This coagulation change is reversible during life, but at death an irreversible coagulation occurs (*rigor mortis*), which is only removed by the solution of the protein through the action of proteolytic enzymes.

Myosis, condition of the eye in which the pupil is abnormally contracted and lacks its power of accommodation. It may be produced by use of certain drugs, e.g. opium.

Myosotis, see FORGET-ME-NOT.

Myrica, genus of evergreen shrubs and trees (family Myrtaceae), bearing axillary peduncles of small white flowers, which are followed in some cases by edible fruits. *M. amplexicaulis* is a handsome shrub sometimes grown in the stove-house; *M. gale* is the bog myrtle, a Brit. plant.

Myriopoda, or **Myriapoda**, class of arthropods which comprises the Chilopoda or centipedes, and the Chilognatha (Diplo-

poda) or millipedes. The body is long and flattened or cylindrical, and the legs are numerous, though, of course, not so numerous as the popular names suggest. In their internal anatomy they resemble the Insecta, with which they have such other features in common as respiration by tracheal tubes and the possession of two antennae on the head, but the segmented body exhibits no distinction between the thorax and the abdomen, while wings are always absent. Their range is very extensive, and they live in dark places, as under stones, heaps of leaves, masonry, and the bark of trees. Some possess powers of luminosity. The centipedes are always flattened and are characterised by a single pair of legs to each segment, the first pair being capable of inflicting poisonous wounds; they are all carnivorous. Millipedes live on vegetation, and apparently have two pairs of legs attached to each segment, but the segments are not perfectly separated; the bodies are round. Some foreign species attain a length of sev. inches. See also ARTHROPODA.

Myristica, tropical trees of the family Myristicaceae, yielding the nutmegs and mace of commerce, and oils and fats. *M. fragrans* yields the best nutmegs and mace, as well as an essential oil used in soap-making and perfumery. *M. officinalis*, of Java, Sumatra, and Celebes yields nutmeg or mace butter, used in pharmacy. *M. cornuta* of S. America is used for candle-wax.

Myrmidones were, according to Gk. legend, an Achaean race which inhabited Pithiotis in Thessaly. Their name is derived from an ancestor, the son of Eurymedusa by Zeus, in the form of an ant, or from the legend of the repeopling of Egina with ants, changed by Zeus into men. In Eng. the term M. is used for a ruthless subordinate, deriving from the loyalty of the M. to Achilles. See *Iliad*, vi. 68; Strabo, viii. 375, ix. 433.

Myron, Gk. sculptor of the fifth century B.C. b. at Eleutherae, on the borders of Boeotia and Attica. He worked almost exclusively in bronze, and was a late contemporary of Phidias, as he made statues of the athletes Timanthes (456) and Lycinus (448). The 'Discobolus' at Rome is one of that city's most important statues because it is not, like so many others, a Rom. copy of a Gk. original, but if not the original work of M., it is at least a very early Gk. copy of it. There is a cast of a 'Discobolus' of his with the head on the wrong way in the Brit. Museum. See P. E. Arius, *Myrone*, 1910.

Myrnonides, Athenian general of the fifth century B.C. In 459 he repulsed two Corinthian attacks on Megara, and by the victory of Cenophyta (458 B.C.) over the Spartans obtained the submission of Boeotia (save Thebes), Phocis, and Locris.

Myrrhine Vases, see MURRINE.

Myrrhis, **Myrrh**, or **Sweet Closely**, small genus of umbelliferous perennial plants. *M. odorata*, a tall, aromatic plant with large tri-pinnate leaves and umbels of white flowers, is Brit., and was formerly

much used as a pot herb and in salads. *Balsamodendron myrra* is a gum-resin obtained from certain trees of Arabia and Ethiopia and is used in incense and for perfumery. M. was also used by the Egyptians in embalming. See MUMMY.

Myrtle, or *Myrtus*, genus of shrubs or trees with white fragrant axillary flowers and ornamental leaves, which are also fragrant. The common M. (*M. communis*) and its numerous varieties are hardy in mild sheltered positions. Its leaves are distilled to yield the perfume Eau d'ange.

Mysia, in ant. geography, was a dist. in the N.W. of Asia Minor, peopled by the Mysi, who were probably akin to the Lydians and Carians. The N. portion was called M. Minor, the S. M. Major. The chief tns. were Pergamum and Cyzicus.

Myslowitz, tn. in Polish Silesia about 45 m. W. of Cracow. There are zinc works, flax-spinning mills, and coal-mines near. Pop. 17,800.

Mysore: 1. Native state of India, surrounded by ter. of Madras, except in the N.W., where it is bordered by that of the prov. of Bombay. It is divided into two regions—the Malnad, or hill country, in the W., i.e. the country bordering on the W. Ghats, and the Maidan, or open country, occupying the greater part of the surface. M. is famous for its varied and picturesque scenery and for its temperate and healthy climate. The chief rvs. are the Kistna, Cauvery, and the Pennar, all unnavigable, and only useful for irrigation purposes. M. suffers less from famine (except 1876-77) than any other internal tract of India. The chief products include silk, coffee, sandalwood, gold, and ivory, but rice, oilseeds, sugar cane, cotton, coco-nut palms, and all sorts of grain (especially 'ragi') are cultivated. It was in the late eighteenth century that Hyder Ali wrested the power from the ancestors of the present dynasty, while his son, Tippu Sultan, largely extended the ter. of M. When Tippu was defeated (1799) the ter. were partitioned and the state of M., in its present shape, was re-assigned to its forerunner, Hindudynasty. In 1865 the present ruler's grandfather was adopted as heir by the maharajah, and in 1881 he was put on the throne of M., and invested with powers under an investment of transfer. M. is a viable unit of the dominion of India, and responsible government has already been constituted in the State. There is a representative assembly of 320 members and a legislative council of sixty-eight members. The maharajah is assisted in the administration by a prime minister and other ministers, half of whom he himself nominates from the elected members of the assembly and council. Area 29,458 sq. m. Pop. 7,328,800 (chiefly Hindus).

2. Cap. of the above state, situated 10 m. S.W. of Seringapatam. M. is a city of wide streets and large, airy, white buildings, which lend themselves to flood-lighting. The city is overshadowed by a hill rising to 1000 ft., making it 3500 ft. above sea level. The maharajah has two palaces—the old state palace and the

summer palace. The latter stands on the summit of the hill. Half-way up this hill is a tremendous carving in rock of one of the sacred characters of the Hindu religion—Nandi the Bull. Higher still, just below the summer palace, is a massive temple. The state palace is the more magnificent of the two and has massive gold pillars everywhere and wonderful stained-glass windows. In the wedding room are solemnised all the royal weddings, and in the hall the lesser princes pay homage



E.N.A

BRAHMIN OF MYSORE READING THE SACRED BOOKS

to the maharajah; here, formerly, the maharajah paid homage to the viceroy. The old palace, an example of Hindu architecture, was partly destroyed by fire in 1877. Its univ. was estab. in 1916. Gov. House was originally built by Wellesley (duke of Wellington). Pop. 150,500.

Mystagogue (Gk. *μυστάγος*, one who initiates into mysteries). The person who in the Gk. religious system supervised the preparation of those seeking initiation, and gave instruction as to the ceremonial to be carried through.

Mystery (Gk. *μυστήριον*, a secret): 1. In Christian theology a truth which cannot be known by the human reason unaided by revelation, and which even when revealed transcends human comprehension, e.g. the Trinity, the Incarnation. 2. A doctrine and its accompanying rites kept secret from all but the initiates, and having some consolatory effect upon those

who shared them. It is necessary to distinguish M. in these two senses from that derived from Lat. *ministerium*, a trade or craft, and more properly spelled 'mystery' (whence M. phys. (*q.r.*), those acted by trade guilds). Among the Babylonians some scholars have detected such a rite in the mystic pantomimes which illustrated the myth of Tammuz and Ishtar. It is, however, doubtful whether we have here a true M., since the doctrines inculcated by these rites were not themselves secret, and the rites purported to do no more than to solace the dead. The earliest Ms. of which we have certain evidence, at least as early as 1875 B.C., are those connected with the legend of Osiris. In Greece certain public cults had secret rites attached to them such as the Arrephoric and Thesmophoric festivals at Athens. But the prin. Gk. Ms. were the Eleusinian and Adanian and the originally non-Hellenic Kabiroi of Samothrace. These were local, whereas the more emotional and licentious Dionysiac and Orphic Ms. were practised by societies which sprung up in various parts of the Hellenic world. In the second century B.C. on the break-up of the Alexandrian Empire and the beginning of the Graeco-Rom. period there was a revival of M. religions which exerted mutual influence one upon another. To this period belongs the cult of Mithra which appears to have made a particular appeal to the Rom. legions who carried it with them wherever they went. The M. religions had this in common, that they offered to their initiates salvation (*euanya*), a better way of life through communion with some saving deity. A M. was entered through an initial rite of purification usually baptism by water, or, as in the case of Mithraism, by blood; communion was estab. by the sharing of some sacred meal or cup; and the initiate then proceeded to the enlightenment (*antra*) in which the doctrine was revealed by a solemn ritual which seems always to have included dancing. It is not possible to determine how far the early Christian missionaries assimilated their gospel to the esoteric doctrines and ritual of the M. religions. There is no evidence that such was the case in the synoptic gospels; but some have discovered such an influence in the epistles of St. Paul; and it is certainly true that the same circumstances which favoured the diffusion of the Ms. assisted also the spread of Christianity. See C. A. Lobeck, *Aquaphanus*, 1829; A. Maury, *Religions de la Grèce antique*, 1857-59; G. Auriel, *Das antike Mysterienwesen*, 1891; F. Cumont, *Textes et monuments figurés relatifs aux mystères de Mithra*, 1896-99; R. Reitzenstein, *Die hellenischen Mysterienreligionen*, 1910; H. A. A. Kennedy, *St. Paul and the Mystery Religions*, 1913; J. Leipoldt, *Die Religion in der Umwelt des Urchristentums*, 1926; and O. Bauhofer, *Das Geheimnis der Zeiten*, 1935.

Mysticism (Gk. *μυστήριον*, secret or hidden), belief in spiritual apprehensions of truths beyond the understanding, can hardly be said to be either a philo-

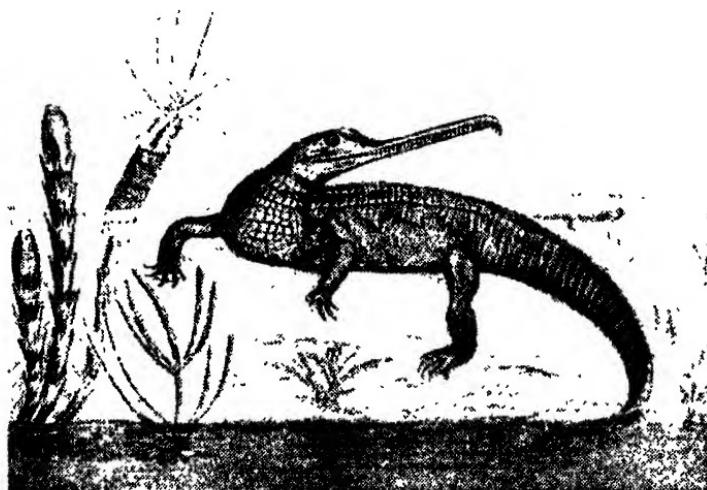
sophy or a doctrine. It may be said to be a tendency in religious feeling, a temper, or an atmosphere. The starting point in M., and its goal, is that unity underlies diversity. So M. has been defined as an 'attitude of mind founded upon an intuitive or experienced conviction of unity, of oneness, of alkeness in all things.' M. leads to a belief that all things are manifestations of the divine life, and that the spirit is the only eternal thing, and, further, since unity underlies all, then man has some share of the nature of God, and through this Godlike part of him can apprehend God: for as through the intellect we apprehend material things, so through the soul can we apprehend the spiritual. So reason is not a part of M. According to M. we can only know thing spiritually by *being* it, and therefore the aim of a mystic is to attain union with the divine, and life becomes one long aspiration, and reality or truth ever and ever deepens and expands. M. appears in Buddhism, Hinduism, and may be said to have had its rise in Plato, although Plotinus, the founder of Neo-Platonism, was the first great European mystic. Then came the Christian mystics of the Middle Ages, headed by St. Augustine and the Syrian monk who ascribed his work to Dionysius the Areopagite, and the great Irish philosopher, Scotus Eriugena, who trans. Dionysius into Lat. from the Gk. In the twelfth and thirteenth centuries may be mentioned Bernard of Clairvaux, Richard of St. Victor, near Paris, and Bonaventura, and in the fourteenth century Richard Rolle, Walter Hilton, Julian of Norwich, John of Chur, and Thomas a Kempis. The Christian M. evolved by these was based on the adoptive sonship of God attained by man through Christ the God-man. Christian M. is thus a deeper realisation of this supernatural unity of man with God through Christ which is finally consummated in the beatific vision. Later we find Paracelsus, Bruno, Campanella, Boehme, Schelling, and Swedenborg. In England we have the Cambridge Platonists, including Henry More and John Smith, and later Wm. Law, Blake, and Coventry Patmore. Among more recent writers, it is only necessary to mention Burke, Coleridge, Wordsworth, Shelley, Keats, Rossetti, the Brownings, George Meredith, and Francis Thompson. To-day among the most prominent are W. B. Yeats and Evelyn Underhill. See also CARRIAGE; QUIETISM; ROSICRUCIANISM; THEOSOPHY, and the articles on the various religions and persons mentioned above. See W. R. Inge, *Christian Mysticism*, 1899; *Studies of English Mystic*, 1906, and *Mysticism in Religion*, 1947; C. F. E. Spurgeon, *Mysticism in English Literature*, 1913; R. Nicholson, *Mysticism in Islam*, 1921; E. C. Butler, *Western Mysticism*, 1922; F. von Hügel, *The Mystical Element of Religion*, 1923; Evelyn Underhill, *Mysticism*, 1924, and *The Mystic Way*, 1930; E. Brunner, *Die Mystik und das Wort*, 1924; J. H. Leuba, *Psychology of Religious Mysticism*, 1925; A. Hopkinson, *Mysticism Old and New*, 1946.

Mystriosuchus, primitive Triassic crocodile, of the archaic order known as the Parasuchia.

Meytens, or Meytens, Daniel (1590-1656), Dutch portrait painter, b. at The Hague, came to England and became portrait painter to Charles I. When Van Dyck was made the king's prin. portrait painter M. wished to go, but was prevailed upon by the king to stay until about 1630, when he returned to Holland. He painted portraits of many notable persons, including Charles I. (in Buckingham Palace), the duke of Portland, the earl of Craven, etc.

quarter of the nineteenth century, but it was at this period that serious attention began to be paid to the comparison and elucidation of the world's store of mythic stories. Karl Otfried Müller (*Prolegomena zu einer wissenschaftlichen Mythologie*, 1825, a book which introduced the method of scientific investigation of myths) attempted to show that in reality M. was but a disease of language, and that the names of divinities were referable to words expressing natural phenomena.

A new school arose with Lang and Frazer, both of whom interpreted M. in



MYSTRIOSUCHUS

FIG. S. W. Williston, *Water Reptiles, Past and Present*, 1914.

Mytho, or Mito, port of Fr. Indo-China at the mouth of the Mekong R., 58 m. S.S.W. of Saigon. Pop. 23,000.

Mythology, that div. of tradition which deals with the acts and deeds of gods and other supernatural beings. It is not, as generally seems to be supposed, necessarily confined to an early state of society, for, in the shape of folklore, it still permeates our customs to a surprising degree. Early efforts to answer the question as to the genesis of the gods led to the formation of many different theories. Thus we find them regarded as the expression of natural phenomena, as the sun, moon, and wind personified. Among the most acute of the early investigators was Euhemerus of Thessaly, who advanced the doctrine that the gods were in reality early heroes exalted as divinities. Many tentative collections of myths other than those of Greece and Rome had been made before the last

terms of savage life and experience. An excellent review of the various theories which have been advanced to account for the origin of religion will be found in W. Schmidt's *Origin and Growth of Religion* (Eng. trans. 1931). The larger work on which this is based is *Ursprung der Gottheitidee*.

Evolution of the Gods.—Until the appearance of Schmidt's epoch-making researches it was generally held that polytheism preceded monotheism in the evolution of religion. Schmidt, working historically and inductively, has shown that the most primitive races now existing (e.g. the pygmies of Africa and the bushmen of Australia) profess a rudimentary monotheism, and that multiplicity of gods and complexity of belief and ritual make their appearance as we ascend the scale of civilisation. Thus animism and fetishism, which were at one time thought to be at the root of all religious M., must now be

regarded rather as early stages in its growth. Animism is the name given to barbarian man's habit of attributing spirit life to the various phenomena of nature. Akin to it is fetishism (derived from the Portuguese word *fetiso*, to make), the belief that wandering spirits may enter, or be coaxed into, objects of peculiar shape, the possession of which will benefit the savage. A further primitive belief which is found at the roots of all Ms. is that of totemism (*t.r.*). These three systems or root-beliefs have provided most Ms. with their pantheons. The spirits which inhabit natural objects, or which are supposed to lurk in natural phenomena, evolve from the animistic form into full-blown deities. Thus, too, a fetish which gains more than personal fame may evolve into a local god. And most totems succeed in achieving godhead after sev. generations of tribal adoration. In the latter class we can discern the animal-headed gods of Egypt and Assyria, while animism supplies us with examples of water- and sea-gods, thunder-gods, and all the pantheons.

Classification of Deities.—The deities of various Ms. fall into sev. well-defined classes. Thus in all systems we have war-gods, water-god, wind-gods, thunder- and lightning-gods, gods of agriculture and the chase, gods of death, and many other mythic conceptions. Many of the deities of certain systems combine two or more of the attributes of godhead. Thus it is common to find war-gods who are also gods of agriculture, and wind-gods or thunder-gods who are gods of the chase. Deities of death quite often preside over agriculture, as it is imagined that the seed arises from their subterranean domain. When mankind partially abandoned the hunter state and entered upon a semi-agric. condition of life, a new type of mythical beings arose. With these man had an implied contract to the effect that he should provide the gods with sacrifice in return for their superintendence of the crops and fruits of the earth. For guidance in the hunt the personal fetish was usually employed, but the health of the crops, and therefore the sustenance of the community, depended upon unseen beings who sent the rain, the wind, the thunder, and the lightning.

Cosmology.—An important dept. of M. is that which deals with the primitive conception of the world and its creation, and the origin of man. The likeness between cosmological myths collected from all parts of the world is extraordinary, and cannot be accounted for by any theory of circulated or borrowed conceptions. We find in most of these the creative agency brooding over a vast world of waters and raising the solid earth from the flood beneath, either by a process of strenuous thought or by physical toil. In other instances the universe is hatched from a cosmic egg. Man often passes through evolutionary types, sev. of which are discarded by the gods until they arrive at human perfection. Behind these we usually discern some dim creative figure, but oftentimes

the universe is the work of a combined pantheon (*see further under COSMOLOGY*).

The following is a brief résumé of the prin. characteristics of the world's most important Ms.

Greece and Rome.—The Ms. of these peoples may be considered together, as in many instances their deities are directly interchangeable. We discover in them a well-defined pantheon ruled over by the great god of the sky, Zeus or Jupiter, who has supplanted a still older generation of divine beings, and wields thunder and lightning. With his wife, Hera or Juno, he rules over a divine galaxy, many of the members of which are related to him. Hephaestus, the deity of smiths, and Vulcan, the Roman god of devouring flames are the craftsmen or artificers—though there is some doubt whether Vulcan was also a presiding deity of smiths, his surname Mulcibes having reference rather to his power of quelling conflagrations. Pallas Athene or Minerva presides over wisdom, but at the same time has something of a martial character as a sort of divine amazon. Ares or Mars is the god of war. Aphrodite or Venus presides over love, and Hermes or Mercury acts as divine messenger between gods and men. Apollo is the god of song and art. Innumerable tales circle around these beings, tales which for beauty of conception and completeness of finish have never been equalled in the hist. of myth. But the Gk. mind speedily discerned the unsubstantial nature of the shadowy system it had itself evolved, and we find very early doubts expressed concerning the real existence of the gods. Probably no mythological system attained such a height of perfection or underwent such speedy collapse as that of Hellas. The M. of Rome, built by a sterner and more conservative folk, held its own for a little longer, buttressed as it was by the power of an upholding state, but it too crumbled speedily before the encroachments of monotheism.

Egyptian Mythology.—In Egyptian M. we find evidence that the faiths of the lower cultus, totemism, animism, and the like, although still permitted to exist, had superimposed upon them the philosophical beliefs of a priestly class which had arrived at a high state of theological capacity. Recognising the folly of communicating abstract beliefs to the ignorant the priestly caste retained so much of the early popular beliefs as seemed good to it, and employed them symbolically for the inculcation of higher religious thought. Thus Herodotus speaks of the apes and other animals kept in captivity by the Egyptian priests, but he is careful to explain that these were in no wise regarded as idols, but as typifying the multifarious attributes of deity. We find the gods of Egypt arranged in triads, or groups of three. Egypt was subdivided into nomes or provs., and each of these possessed its triad of gods. Thus Osiris, Isis, and Horus at one time presided over one of these localities, but later, because of their exceeding popularity, became the national gods. The myth of Osiris, his birth,

reign, and death, typifies the daily journey of the sun. His wife, Isis, and their son, Horus, lost all their original characteristics when they were interwoven with the Osiris myth. Nephthys, sister to Isis, probably represents the sunset. She was wife to Set, brother to Osiris, and god of darkness, who finally triumphed over his brother. Wisdom was personified in the god Thoth, or, as he was called by the Gks., Hermes Trismegistos. Anubis, or Anpu, presided over the lower regions, and was the patron of embalming. He was figured with the head of a jackal. Pasht, or Bubastis, the cat-headed, represented the heat of the sun. Besides these primitive deities a large number of the kings of Egypt were deified. An enormous and elaborate ritualistic system had crystallised round this M., much of which is represented in the *Book of the Coming Forth by Day*, and deals with funerary practices. It is, in fact, a guide to the soul after death through the various divs., of Amenti, the sad underworld of the dead.

Semitic Mythology.—In early Semitic M. polytheism had many of the features of totemism and animism embedded in it. There was also a widely distributed system of pillar worship, and each 'high place' and mt. appears to have possessed its special deity or *ba'al*. In the book of Genesis there is confirmation of the polytheistic condition of the early Israelites, for whereas a deity, Jahveh, is alluded to frequently, we find sev. notices of beings called the Elohim, the plural ending of whose name may denote multiplicity. Obviously a later monotheistic version has been combined with an older polytheistic one. The polytheism of the races surrounding Israel was merely a continuation of this old belief, and the monotheism of the Israelites arose in all probability from the great popularity of Jahveh, who had led them out of captivity into a happier sphere, who was a jealous god, and would brook no rivalry. The religions of Babylon and Assyria were widely polytheistic, including as they did gods which represented every attribute and phase of deity. In Babylonian myth we find a great triad, Anu, En-lil, and Ea, who are at strife with darker deities, Apsu, Tiamat, and Marduk. The generic title *Bēl* was bestowed on all gods alike. Dagon was probably a corn deity. One of the prin. Assyrian deities was Ashtaroth, or Astarte, the wife of Marduk and the goddess of love, and typical of fruitfulness. Ashur, from being the local god of the city of that name, became the head of the Assyrian pantheon, and was chiefly famous as the national god of war. There was a host of smaller gods with little more than a local significance.

Hindu Mythology.—The mythic system of the Aryan conquerors of India is polytheistic. The head of their pantheon is Brahma, whose leadership is oft-times, however, threatened by other powerful gods. The fullest account of the Hindu M. is to be found in the Vedic hymns. Brahma is passive, but when he acts he is given another name, Vishnu the Pre-

server, a more 'human' deity than the impersonal Brahma. Siva is Brahma in his guise as a punisher and destroyer. Varuna is god of the waters, and Indra wields the storm and the lightning. Vishnu has had many *avatars*, or incarnations, as has Durga, Siva's wife, the destroyer of demons. Innumerable inferior deities cluster around these conceptions.

Teutonic Mythology.—Perhaps the most important of the European mythic systems is that of the anct. Teutons. At the head of their pantheon was Odin, or Wotan, the All-father, who presided over the destinies of both gods and men. He possesses all the characteristics of a sun and sky god. His consort, Freya, typifies the Scandinavian matron and housewife. Thor was god of thunder and the Scandinavian Vulcan. Tyr was the sword-kod and god of war. Loki was the mischievous god of evil. Balder, the graceful god of light and summer, whose myth typified the death of that season. The Scandinavian idea of the universe was that the *aesir*, or gods, dwelt at the top of the world-tree, Yggdrasil. Round this tree coiled the great world-snake. At its roots dwelt Hel, the dark goddess of death. In Midgard dwelt the race of men. But in the Norse conception even Asgard and its deities would not endure for ever. On the contrary, before the eyes of the gods there ever loomed a day of doom, when after the battle of Ragnarok they and the powers of evil would mutually destroy each other, darkness and chaos prevail, and a new heaven and earth be born.

Celtic Mythology.—The Celts in France and Britain possessed a well-defined mythological system, particulars of which can be gleaned from the remains of altars and images in France and England, and from the mythological tales of Wales and Ireland. The Celtic religion was strongly influenced by primitive elements, totemic, animistic, and agric., and although later in the hist. of the Celtic race new circumstances prompted the evolution of new deities, those of growth and fertility were probably the most important. Most of the divinities, however, were tribal or local in character. In anct. Gaul we find Ogminus equated by the Romans with Mercury, and Boro, Belenos, Grannos, and many more—all local gods—with Apollo. The martial character of the Gauls tended to the evolution of many war-like deities, Camulos, Alborix, Caturix. Animal and nature gods also abounded, as Mullo, a mule-god, Vintius, a wind-god. 'Corn-nothers' were numerous and local, as, for instance, the famous Berecyntia, of Autun. In the mythical tales of Ireland we meet with a number of supernatural races, such as the Fomorians, Firbolgs, and Tuatha Dé Danann, all of which probably represent the sev. pantheons of various emigrant races. The most prominent Fomorians were Balor, a personification of the evil eye; Bres, probably the god of night, or perhaps of growth; and Domnan, a goddess of the depths of the earth. Of the Tuatha Dé Danann, which means 'the folk of the goddess Danu,' the prin.

deities are Dagda, the most important of all Irish gods, who was probably an earth or agric. deity; Oengus, son of Dagda, a god of growth; Nuada 'of the Silver Hand,' who may have been a harvest god; Manannan, god of the seas; and Lug, the sun-god. The prin. Brit. Celtic divinities, as treated in the Welsh *Mabinogi* and other myths, were Llyr, god of the sea, and his sons, Bran and Manawyddan, all associated with the ocean; Dôn, the Brit. equivalent of the Irish Danu; Gwydion, a sort of Celtic Proteus; Arianrhod, an earth-goddess; and Govannon, equivalent to Vulcan. In the Arthurian romances we find many mythological characters disguised, but any consideration of these cannot be embraced in the limits of this article.

See G. W. Cox, *Mythology of the Aryan Nations*, 1870; Sir E. B. Tylor, *Primitive Culture: the Development of Mythology and Philosophy*, 1871; J. Dowson, *Classical Dictionary of Hindu Mythology*, 1879; W. J. Wilkins, *Hindu Mythology*, 1882; A. Lang, *Custom and Myth*, 1884; *Myth, Ritual, and Religion*, 1899; and *Tales of Troy and Greece*, 1925; W. H. Roscher, *Ausführliches Lexicon der griechischen und römischen Mythologie*, 1884-1925, and supplement by O. Gruppe, *Geschichte der klassischen Mythologie und Religionsgeschichte*, 1921; A. V. Rydberg, *Teutonic Mythology*, 1889; A. Erman, *Handbook of Egyptian Mythology*, 1905; W. Smith, *Classical Dictionary of Greek and Roman Mythology*, 1894; F. M. Müller, *Contributions to the Science of Mythology*, 1897; E. A. W. Budge, *The Gods of the Egyptians*, 1904; C. Squire, *Mythology of the British Islands*, 1905; Sir J. G. Frazer, *The Golden Bough*, 1907-1915; J. A. MacCulloch, *Religion of the Ancient Celts*, 1911; D. A. MacKenzie, *Indian Myth and Legend*, 1913; L. H. Gray, J. MacCulloch, and G. F. Moore (ed.), *Mythology of All Races*, 1916-1932; E. Cassirer, *Sprache und Mythos*, 1925; J. E. Harrison, *Mythology*, 1925; L. Spence, *Myths and Legends of Ancient Egypt*, 1925, and *Hero Tales and Legends of the Rhine*, 1927; W. Schmidt, *Ursprung des Gottesidee*, 1926-1935; P. Culum, *The Children of Odin*, 1929; H. A. Guerber, *Myths of the Norsemen*, 1929; T. W. Rolleston, *Myths and Legends of the Celtic Race*, 1929; E. O. James, *Comparative Religion*, 1938; and C. G. Jung and K. Kerényi, *Einführung in das Wesen der Mythen*, 1941.

Mytilini, or **Kastro**, name of one of the three dists. and also of its cap. in the is. of Lesbos. The latter is divided into Molivo in the N., Calloni in the W., and Kastro in the E. M., or Kastro, the chief tn. of this dist. is built in the shape of an amphitheatre surrounding a small hill surmounted by an ant. fortress. It was at first situated on an is. close to the E. coast of Lesbos, but as the tn. grew the is.

were joined by a causeway, and M. expanded along the coast. During the Peloponnesian war the tn. revolted, and was besieged from 429 to 427; it was the scene of a battle between Callicrates and Conon in 105. Pompey raised M. to the status of a free community. Pop. 31,600.

Mytton, Flags, series of rocks of Lower Ordovician age, occurring in Shropshire. They consist of thick shales or flags made of ashy material, with a few fossils, including trilobites. They are remarkable for their copious supply of zinc, lead, and barytes, and some of the mines were worked by the Romans in Britain.

Myxoedema, metabolic disease caused by disturbance of the function of the thyroid gland. This gland, which lies in front of the windpipe, is one of the so-called ductless glands. Its function is the secretion of the hormone *thyroxia*, which speeds up metabolism, growth, and mental activity. If the gland be removed by operation a state of sluggish metabolism sets in, with depression of mental function. The symptoms observed are similar to those occurring in the course of the disease described by Sir Wm. Gull in 1873, and known as Gull's disease or M. The body increases in bulk, and the subcutaneous tissue of the face and hands becomes infiltrated with a mucin-like substance, causing a swelling which does not pit on pressure. The mental processes become sluggish, the speech becomes halting, and there is marked loss of mental and physical energy. One of the characteristic symptoms is a total absence of sweating. The disease may run its course for many years with gradually increasing intellectual and physical incapacity. The connection of the disease with the loss of activity of the thyroid gland is demonstrated by the similarity of the symptoms to those of operative M., the existence of cases in which the thyroid gland is shown to be atrophied, and the fact that administration of thyroid extract causes a marked amelioration of the symptoms.

Myxogastres, Myxomycetes, or Mycetozoa, group of widely distributed organisms numbering some 500 species. Some of them were known by the middle of the nineteenth century, and were understood to be fungi, but the spores on germination, instead of producing germ tubes, give rise to amoeboid bodies; these have the power of spontaneous movement, and combine in a solid mass or plasmodium or vegetative condition which remains buried in the matrix or host until it creeps to the surface and produces its spores in a position whence the wind will disperse them. Most Ms. are saprophytic, and some creep over and suffocate seedlings, but a few are parasitic on cultivated plants and trees, causing such destructive diseases as finger-and-toe, corky scab of potato, and crown gall. *See also under FUNG.*

N

N, fourteenth letter of the Eng. alphabet, follows M in most alphabetic scripts. Also its shape closely followed that of the letter M (q.v.). In the N. Semitic, the early Gk., Lat., and Etruscan alphabets, which were written from right to left, *n* was written *M̄*. Gradually it assumed the shape N. N. The *n* minuscule developed slightly later than the *m* minuscule (see M.). The sound N is determined by the position of the tongue against the palate. N, in Eng., standing by itself, is alveolar, and is pronounced with the tongue against the teeth sockets by expelling the breath through the nose. It is palatal or guttural according to the following sound. Thus in *branch* it is a palatal, while before *g* and *k* (e.g. *bank, thing*) it is a nasal. N and M have often been interchanged in the Eng. language. For instance, N tends to become M finally and when followed by *b, p*, or *f*, as in *time, Cambridge, hemp*, and *comfort*, from O.E. *ti hī, Cantabrigie, heuen*, and Late Lat. *confortare*, respectively. On the other hand, a medial N may be derived from an M, as in *ant* (O.F. *ameute*, M.E. *emet*, *duet*). N is often found in conjunction with D, the latter dental being used to elicit the sound of the former. Thus D is frequently introduced between N and L, or N and R, as in *spindle* (O.E. *spindel*), *thunder* (O.E. *gunor*). Finally, D is sometimes dropped (e.g. *woodbine*, O.E. *wudubinde*), and sometimes developed (e.g. *sound*, O.E. *suuw*). Initially, through popular etymology or careless pronunciation, N has been introduced in *nickname, nowt, etc.* (O.E. *næc + nama, efe*), and dropped in *orange, adder, apron, etc.* (M.E. *norange, nadder, naperon*). In chem., N is the symbol for nitrogen, Ne for neon, Nd for neodymium, Ni for nickel, and Nb for niobium.

Naarden, tn. of Holland in the prov. of N. Holland, 20 m. S.E. of Amsterdam. The old tn., adjoining the IJsselmeer (Zuider Zee), is fortified by wide ditches in a geometrical pattern of the Vauban type, constructed in 1692. Pop. 6000.

Naas, tn. and urb. dist. of co. Kildare, Eire. It lies 20 m. S.S.W. of Dublin on the Great S. Railway. Pop. 3600.

Naba, *Napa*, or *Naha*, tn. and seaport on Great Liuikit Is., Japan. Sugar, cotton, and silks are exported, and there is manuf. of hats similar to the Panama straw. Pop. 65,200.

Nabadwip, see *NADIYA*.

Nabatei, or **Nabathaei**, Arabian people, who occupied nearly the whole of Arabic Petra, on both sides of the Elanite Gulf of the Red Sea and the Idumean Mts., where they had their rock-hewn cap. Petra. We first hear of the N. in 312 B.C. in connection with the attack upon them by Athenaeus, general of King Antigonus I., which ended in disaster. The N. at this time were uncivilised, but they

gradually advanced, and by the end of the second century B.C. became a power to be reckoned with. N. eventually fell under Rom. power, and we last hear of them in A.D. 106. Traces of Nabatean culture are found widely in Transjordan. Pottery has been excavated at Jerash, proving that their trade extended beyond the confines of their ter. in S. Transjordan, and Nabatean stations marked with thousands of fragments of pottery have been found the entire length of the Wadi Arabah. The further we penetrate southward into the desert along the E. side of Transjordan the more does the widespread nature of the Nabatean occupation become apparent and it is evident that the N. occupied the desert more fully than did the Romans. This is proved by the remains of their fortresses and military outposts. The most commonly known Nabatean deity is *dhu-Shara* (Dushara, Dusares, i.e. Dionysos) and numerous dedications to him in Nabatean and Gk. have been found in temples in Transjordan. In these remains, numerous Nabatean gods, whose existence had theretofore been unknown, have been indicated. Most notable is the temple of Kherbet Tanner. See N. Glueck, *The Other Side of the Jordan*. 1940.

Nabbes, Thomas (1605-41), Eng. dramatist, native of Worcestershire. He began his career as a dramatist about 1630, and his chief plays are *Hannibal and Scipio* (1635); *Cordent-Garden* (1638); and *The Spring's Glory* (1638) containing his best work. He also wrote a continuation of Knole's *General Historie of the Turkes*. See works, ed. by A. H. Bullen, in *Old English Plays*, 1887.

Nabha, state of India, in the Patiala and E. Punjab Union. Area 947 sq. m. Pop. 340,044.

Nabis, ruler of Sparta (206-192 B.C.). He usurped the throne and allied himself first with Philip of Macedon and later with Rome. In 201 B.C. he took Messene, but was driven out by Philoprenes in 200 B.C. Later he ravaged the surrounding ter. and occupied Argos, but was driven out by the Corinthians. He was assassinated by Alexanderus.

Nabium, see *NEBO*.

Nabius, or **Nabulus**, tn. of Palestine, 33 m. N. of Jerusalem. It manufs. a special brand of soap containing olive oil. It is peculiar among Palestinian towns, in having retained its more recent name, Neapolis, in preference to its original name Shechem. Shechem is associated with the earliest period of Jewish settlement, for here Abraham pitched his tent on entering Palestine, and set up the first altar to Jehovah on a spot still shown on Mt. Ebal. It was to Shechem, which lies in the narrow valley separating Mt. Ebal from Mt. Gerizim,

that Joshua led the Israelites after the miraculous passage of the Jordan. N. was captured by the crusaders under Tancred, and an important eccles. council was held here in the reign of Baldwin II. One of the best authenticated holy sites in Palestine is Jacob's Well, which lies just outside the E. end of the tn., below the vil. of Sychar. N. itself is long and narrow, and is traversed by two parallel *sugs*, containing sev. mosques, which were formerly crusaders' or Byzantine churches. This part of the tn. was severely damaged by earthquake in 1927 but has largely been rebuilt. The Great Mosque in the E. part of the tn. was originally a basilica built by Justinian and was rebuilt by the crusaders. Many Jews were murdered here in the Arab revolt of 1929. Pop. 23,200.

Nabob, corruption of the Hindustani *nawab*, originally used only as a title for native Indian rulers, great officers of the Mogul's court, and governors of provs. The title was also used for the governors-general of the Brit. possessions. In the eighteenth century the title came to be used familiarly for any person who returned from a far country with great riches.

Nabopolassar, Chaldaean soldier, viceroy of Babylon and father of Nebuchadnezzar. When the Assyrian Empire had become weakened by the loss of blood and treasure in the conflicts and conquests of Assurbanipal (see BABYLONIA), N., having quelled a revolt in Babylonia, seized the throne of Babylon (625 B.C.). For a considerable period he occupied himself in the consolidation of his Babylonian dominions; but when the Assyrian Empire was beginning to totter beneath the blows of the Medes, he entered into an alliance with these assailants of what had so long been the dominant power in S.W. Asia, and took as a wife for Nebuchadnezzar, Amytis (Amuheia in Eusebius), daughter of the Median king Astyages. Together the allies besieged and at length captured Nineveh; but meanwhile Pharaoh-Necho (see 2 Chron. xxxv. and xxxvi., and 2 Kings xxiii.), who is celebrated in Herodotus for having attempted to unite the Mediterranean with the Red Sea by a canal, anxious to secure some share of the crumbling empire, conquered Syria and occupied Carchemish, which guarded the ford on the Euphrates. N., who had associated his son, Nebuchadnezzar, with him on the throne, sent him to encounter Necho, who was completely defeated. N. was succeeded by his son in 604 B.C.

Nabu, see NERO.

Nabua, tn. in the prov. of Ambos Camarines, Luzon, Philippine Is., 20 m. S.E. of Nueva Ecija. Pop. 19,000.

Nachtigal, Gustav (1834-85), Ger. explorer, b. at Eichstätt, near Stendal. In 1869 he set out from Tripoli on a mission from the king of Prussia to Bornu, visiting Tibesti and Borku, hitherto unvisited by Europeans, and by way of Bagirmi, Wadai, and Kordofan, arrived unexpectedly at Khartoum in 1874. In *Sahara und Sudan* (1879-89) he pub. an account of his travels. In 1882 he was

appointed Ger. consul-general at Tunis. His mission to W. Africa in 1884 resulted in the annexation to Germany of Togo-land and Cameroon.

Nacrite, rare unsilicate mineral occurring in four-sided prisms in metamorphic rocks, both schistose and granite. It is friable in character, gleaming and pearly, consisting of greenish-white scaly plates, greasy to the touch. It comes under the species kaolinite, and is found in Wicklow in Ireland, and in N. America.

Naden, Constance Caroline Woodhill (1858-89), Eng. anthorose and poetess, b. at Edgbaston, Birmingham. She was much esteemed by Gladstone for her poems. Her works include *Songs and Sonnets of Springtime* (1881), and *A Modern Apostle, The Elixir of Life, and other Poems* (1887). Her complete poetical works were pub. in 1894. See W. R. Hughes, *Constance Naden: a Memoir*.

Nadezhdinsk, tn. of the Sverdlovsk Region of the R.S.F.S.R. Iron ore is mined, and also bauxite ore for aluminum. It is a centre of the fur trade. Pop. 64,700.

Nadia, see NADIYA.

Nadir (1688-1747), the Conqueror, shah of Persia, b. at Khorassan. He drove out the Afghans from Persia and restored Tahmasp II. to his throne (1725-27); N. himself imprisoned him and became regent for his infant son Abbas III. (1732). The latter d. in 1736, and N. was crowned. He extended his kingdom as far as Kandahar and Delhi (1738-39), but his tyrannical government caused much disaffection, and he was assassinated. See life by Sir H. Durand, 1908.

Nadir (Arabic *nazir*), astronomical term denoting the point in the heavens which is directly beneath our feet as that directly overhead is called the zenith. A line drawn from our feet through the centre of the earth would cut the celestial sphere at the nadir. In figurative language, the lowest point or lowest stage of depression.

Nadiya, or **Nabadwip**, cap. of the Nadinya dist., E. Bengal, Pakistan, formerly situated on the Bhagirathi R., which has since altered its course. Near by is the battlefield of Plassey. Pop. 14,500.

Nævius, Gnaeus (c. 261-c. 194 B.C.), Rom. poet and dramatist. He came into prominence in 235, and composed an epic poem as well as writing tragedies and comedies. He attacked Scipio and the Metelli in his plays with entire recklessness, but was indicted by Q. Metellus and imprisoned; he recanted but later expiated a further offence by exile. He retired to Utica, where he d. c. 202 B.C. His poem on the first Punic war in the old Saturnian metre was the first Rom. national epic, but only a few fragments are extant. Although adapting Grk. tragedies and comedies N. had a distinct vein of native originality, and ranks high among the Lat. authors of his day.

Nævus, area of pigmentation, or mole; a tumour of the skin composed almost entirely of enlarged blood vessels. A mole is not dangerous, and does not tend to spread, therefore it usually requires no treatment. A vascular N. may diminish

in size of itself, in which case no treatment is necessary; or it may show a disposition to enlarge, thus constituting a possible danger through haemorrhage. The N. may be capillary, consisting of enlarged capillaries giving rise to a purplish mark known as 'port-wine stain'; it may be venous, consisting of enlarged veins, giving a bluish appearance; or arterial, when pulsation can be felt. The N. may be removed with the knife, or by tightly ligaturing the base, or by tightly coagulating the blood by electrolysis and other means.

Nafa, see NABA.

Nâga, name given to deified serpents in Hindu mythology; Sesha, the king of the snake world, is the sacred serpent of Vishnu. *See also MYTHOLOGY.*

Nagappattanam, see NEGAPATAM.

Nagar, see HUNZA AND NAGAR.

Narkotk, see KANGRA.

Nagas (*naga*, a snake), name of a non-Aryan group of peoples of E. Assam, alleged to be head-hunters, who live between the middle Brahmaputra and the Chindwin. At one time great virtues were ascribed to them. According to Indian mythology the N. are a race of demons descended from Kadru, the wife of the sage, Kasyapa. They have a jewel in their heads, giving them a sparkling appearance, and inhabit one of the seven beautiful worlds which lie between this world and the hells. Their world is ruled over by three chiefs, Sesha, Vasuki, and Takshaka; it is recorded that their daughters often wedded with man (compare the habits of mermaids as exemplified in W. folk-lore). The old sage, Gange, one of the fathers of Indian astronomy, was said to owe all his wisdom to the god Sesha. *See also MYTHOLOGY.* *See T. C. Hodson, The Naga Tribes of Manipur, 1911; and W. C. Smith, The Ao Nagas, 1926.*

Nagasaki, city of Japan on the is. of Kyushu, at the head of a long bay which forms its natural harbour. It is situated at the W. extremity of the peninsula of Fizen, which forms the N.W. portion of the is. of Kyushu. The harbour, one of the most beautiful in the world, is some 6 m. in width, and 3 or 4 m. in length. The hills surrounding the harbour are broken into long ridges and deep valleys, while the more fertile spots are terraced and under cultivation. Before its devastation in 1915, the W. shore was occupied by port facilities, shipbuilding and repair, and the E. shore by smaller shipyards, wharves, and dwellings. The main commercial and residential area of the city lay on the small plain near the head of the bay on its E. shore. From here the valley of the R. Urakami runs N. for several miles and a smaller valley branches N.E. for 2 m.; the smaller valley was crowded with dwellings, huddled around narrow roads, market streets, and temple squares; the Urakami valley contained large steel, engineering, and armament works, together with smaller factories and a mass of workshops and workers' dwellings. These industries, controlled by the firm of Mitsubishi, plainly dominated Nagasaki,

where everything which survived bore the stamp of a vast industrial slum. Early in 1945 some dispersal was begun to workshops set up for the purpose in tunnels and schools, and the latter, built of reinforced concrete, were among the few imposing buildings in Nagasaki. The city did, however, possess a fine complex of modern hospital and medical school buildings. Nagasaki was once a naval base but its importance declined with the development of the base at Sasebo. In 1940 its pop. was 253,000, having risen only slowly since 1930, but it had continued to rise during the Second World War, which gave new importance to its shipbuilding and to its production of torpedoes and other armaments. When the atomic bomb fell (Aug. 9, 1945) the pop. was 260,000. 1½ sq. m. of the city were destroyed, and 24,000 people were killed; 30,000 were injured and many of these died later. The centre of damage wrought by the atomic bomb was in the industrial area between the two large Mitsubishi ordnance plants in the Urakami valley. Hence the harbour and the commercial area, 2 m. distant, escaped with minor damage, as also did the housing in the smaller valley screened by the intervening high ridge of hills (for which reasons the area of damage and with it the death roll were smaller than in Hiroshima) (*q.v.*). The few previous attacks on Nagasaki had been aimed at the shipyards, so that most of the damage from them was outside the area of atomic bomb damage; but, as in Hiroshima, the initial blast damage done by the atomic bomb was followed by extensive fires. Nagasaki in 1946 presented the appearance of a city struck by a brief but tremendous hurricane, and the scale of the disaster brought city life and industry virtually to a standstill.

A 50 ft. tower now marks the spot where the bomb fell and the devastated area, on which are playing fields, is surrounded by 1000 new dwellings. In the dock area shipbuilding is again active and the residential areas bear little trace of the disaster. There is a plan to rebuild the city as a cultural centre.

Nageli, Hans Georg (1773-1836), Swiss musical composer, *b.* at Westzikon, near Zurich. In addition to composing music, he pub. and ed. the best classical works, including Beethoven's sonatas, and an excellent version of Bach's 'Forty-eight' from an original in the composer's handwriting. He estab. the *Schweizerbund* choral society, which soon formed branches, and reformed the teaching of music in schools on the lines of Pestalozzi's educational system. *See* lives by R. Hunziker, 1924, and A. E. Cherbuliez, 1938.

Nägeli, Karl Wilhelm von (1817-91), Swiss botanist, *b.* at Kilchberg near Zurich. After studying botany at Geneva under Candolle, he graduated at Zurich Univ., and was ultimately appointed prof.-extraordinary of that institution. In 1832 he was appointed to the chair of botany in the univ. of Freiburg-in-Breisgau and, in 1857, was promoted to Munich, where he remained as prof. until

his death. He is famous for having proved, in 1862, by chemical analysis that protoplasm is nitrogenous and differs from other cell constituents. He is one of the fathers of biochemistry. One of his most notable discoveries was that of the antheridia and spermatozoids of ferns and of *Pilularia*. He wrote *Pflanzenphysiologische Untersuchungen* (with Cramer), *Die Neueren Algensysteme*, and *Mechanisch-physiologische Theorie der Abstammungsliebe*, and with S. Schwendener, *Das Mikroskop* (1865-67).

Nagina, tn. of the United Provs., India, in the dist. of Bijnaur, with an important trade in sugar, cotton cloth, glassware, and ebony carvings. Pop. 26,000.

Nagorno-Karabakh, autonomous Region of the Azerbaijan S.S.R., in the S.W. of the republic. The cap. is Stepanakert.

Nagoya, cap. of Owari prov. on the is. of Honshu, Japan, lying at the head of the shallow Isenoumi Bay some 30 m. from Yokkaichi, 94 m. from Kyoto and 235 m. from Tokyo. It was the fourth city of Japan in size before the Second World War, its pop. (1940) being 1,323,000. It is the hub of railways running N.W. and W. to Gifu and beyond, N.E. and S.E. to Kifu and beyond, and along the coasts of Senoumi Bay. Its old castle dated back to the early seventeenth century, and in modern times it was used as a military depot; but it suffered irreparable damage in the Amer. air raids. The religious buildings of N. included the Buddhist temple, Higashi Hongwanji. In N. were the famous Seto potteries, as well as large cotton mills. Especially notable were its silk and cotton fabrics dyed so as to show spots in relief with radiating colours. Cloisonné enamelling in Japan had its beginnings in N. But little of the tn. survived the Second World War: some 500 Amer. Superfortresses laid the city waste on May 13, 1945; and it was also hit on other dates.

Nagpur: 1. Dist. and a div. of the Central Provs., India. The N. part of the prov. is mountainous in character, being traversed by spurs of the great Vindhya Range. The climate is not healthy, and is especially insalubrious in the extensive tracts of low marshy land which abound. Area 23,521 sq. m. Pop. approaching 4,000,000. Between 1920 and 1947 N. was under a Brit. governor. 2. City of India, cap. of the Central Provs. and Berar, 430 m. E.N.E. of Bombay. Cotton cloths, coarse and fine chintzes, turbans, silks, brocades, blankets, woollens, tent-cloths, and articles in copper and brass, are manufactured. One of the eight federal univs. of India is at N. and was founded in 1923. There is also an engineering school. Pop. 301,957.

Nagybecserek, see BECSKEFÉKÉRÉK.

Nagy-Kikinda, or Vel Kikinda, tn. in Dunar prov., Yugoslavia, near the Rumanian border, with important trade in wheat and fruit. Pop. 25,000.

Nagy-Körös, tn. of Pest co., Hungary, 10 m. N.E. of Kecskemet. Melons, maize, and wheat are grown. Pop. 29,900.

Nagykunság, see KUMANIA.

Nagyszében, see SZIBÉC.

Naha, see NABA.

Nahrel Asi, see ORONTES.

Nahuel Huapi, Lake, lake of Argentina, belonging to the same natural system as the Chilean Lakes (Todos Santos, Llanquihue, and others), from which it is not far separated. It has an area of 800 sq. km. and is more than 330 yards deep in some places. It stands 2500 ft. above sea level in full view of the peaks of the Cordillera. Mt. Tronador commands the scene and the blue waters of the lake, the mts., and the natural solitude contribute to its charm.

Nahum, seventh of the minor prophets, is described in the title of his work as an Elkoshite, and the tradition narrated by Jerome which identifies N.'s vil. with a certain vil. of Galilee is generally accepted. In Jerome's time this vil. bore the name of Elkies. The prophecy deals with the fall of Nineveh, which is described with great vigour and majesty. The expression is clear, and the thoughts are striking. In ch. iii. 8-10, it is said of Nineveh that she will be as little able to avoid destruction as was Thebes (No-amon), and it is from this reference that the date of the prophecy must be fixed. From it one can say certainly that N. prophesied between 664 and 607 B.C. See A. B. Davidson, 'Nahum, Habakkuk, and Zephaniah,' in *Bible Commentary*, 1896.

Naiads, see NYMPHS.

Naidu, Sarojini (Mrs.) (1879-1949), Indian poet, feminist and governor, b. at Hyderabad, daughter of a Bengal Brahmin educationist and principal of the Nizam's College, Hyderabad. She was educated at Madras Univ., King's College, London, and Girton College, Cambridge. Her first work, *The Golden Threshold* (1905), with a preface by Arthur Symons, is western in imagery and sentiment. Her second vol., *The Bird of Time*, with an introduction by Edmund Gosse (1914) also revealed her lyric powers. This was followed by another book of collected poems, entitled *The Broken Wing* (1917). These too showed her mastery of metrical form, besides earning for her the title of 'the nightingale of India.' But thereafter she became too much engrossed in public affairs and, particularly, the feminist movement, to devote her life to literature. She was the first Indian woman to occupy the chair of the National Congress (1925), Mrs. Besant being the first woman to do so (1917). Later she toured America and Canada as a Congress propagandist and took part in Gandhi's non-co-operation cult. In 1931 she accompanied Gandhi as the sole representative of the Congress to the second session of the Round Table Conference. She was twice imprisoned for participating in the civil disobedience movement, and again in 1942, with other members of the Congress, for obstruction to the allied cause, being released on grounds of health in 1943. She took a prominent part in the long negotiations which resulted in the setting up of the independent dominions of India and Pakistan and was appointed governor of the United Provs. For her efforts in relief work in Hyderabad in the floods of

1908 she was awarded the Kaiser-i-Hind gold medal. She did much to break down the barrier of *purdah*, which had so long been strictly observed in that city, and after partition her influence was the major factor in preventing communal riots.

Nail. Until a comparatively recent period almost every kind of N. was produced by hand labour: each N., however minute, was separately forged from a thin rod of iron, a process which is still followed in the production of what are technically known as wrought Ns., which possess certain advantages, for particular kinds of work, over those formed either by casting, or by cutting or stamping out of rolled sheet metal. For some purposes Ns. formed by the much cheaper process of casting have been long used. Common cast Ns. are, however, so clumsy and so brittle that they can only be used for a few coarse purposes as in plasterers' work, and in the nailing up of fruit trees. By the introduction of great improvements in the manuf., however, a very useful kind of cast N. of an exceedingly pure material, has been successfully introduced for certain descriptions of woodwork. They are annealed to such perfection that the metal will bear far more bending than ordinary wrought iron without injury. This extraordinary degree of tenacity is, however, obtained at the expense of rigidity, such Ns. being often nearly as soft as copper, and therefore quite unsuitable for use in hard woods. In the making of cut Ns., the Ns. are cut from sheet-iron of suitable thickness, which is first reduced by cutting transversely into strips or ribands of a breadth equal to the intended length of the Ns. See also SCREWS; SCREW-NAILS or WOOD-SCREWS.

Nain, Le, Antoine (1588-1648), Louis (1593-1648), and Mathieu (1607-77), three brothers, Fr. painters, sons of a sergeant, and all b. at Laon and d. in Paris. After being taught the elements of art, they went to Paris, where Antoine took pupils in 1629. They were all original members of the Fr. Academy, though little is known about their lives, while their works show no trace of the influences which prevailed when the academy was formed, as, for example, the preoccupation of Fr. taste for mythological allegories or the 'heroic deeds' of the monarch; and as their signature is rarely found and never accompanied by initials differentiation between the brothers is almost impossible. Although they were themselves Fr., their subjects suggest Holland and their methods Spain. These consist of familiar objects and incidents, such as tavern interiors, card-playing, domestic diversions. The genre pictures are said to have been painted by Louis and Antoine conjointly. Mathieu painted subjects for churches and also portraits — among the latter being Cinq-Mars, Mary de' Medici, Cardinal Mazarin, and Anne of Austria—but none has survived. Room XII. of the Louvre is dominated by the brothers, the chief pictures there being 'Boys Playing Cards,' 'The Forge,' 'The Peasants' Noonday Meal,' 'The Watering Place,' and 'The Holy Manger.' In the

Florence museum is 'The Adoration of the Shepherds'; in Valenciennes, 'Two Men Playing at Cards'; in Rouen, 'Rustic Interior'; in Stafford House (London) 'Fife Player'; at St. Laurent (Paris) 'The Nativity of the Virgin'; and at Munich a striking picture of a painter at work on a woman's portrait. There are also some fine drawings by the brothers in the Brit. Museum. Chardin wrote two works on the brothers (1850, 1861). See also A. Valabregue, *Les Frères Le Nain* (1901).

Nain: 1. Anct. tn. of Galilee, 26 m. S.E. of Acre. Mention is made of this city in Luke vii. 11, 2. Station of the Moravians on the Labrador coast. Pop. 300.

Naini Tal, dist. and tn. in the United Provs. India. The dist. which is well wooded, has an area of 2627 sq. m.; the prin. crops are wheat and rice, some fruit, and a little tea in the hilly parts. Pop. 291,000. The tn. is 70 m. N. of Bareilly, and is the summer headquarters of the prov. gov. Altitude 6400 ft. Pop. 10,000.

Nainsook (Hindu, *nain*, eye: *sukh*, delight; but the etymology is doubtful), thin muslin-like material of fine texture, with a soft finish, and either plain or striped. It is a kind of jacquard and was formerly made in India.

Nairn: 1. Maritimo co. of N.E. Scotland, bounded on the N. by the Moray Firth, and on its other sides by the coxs of Inverness and Moray. Salmon fishing is an important industry. Agriculture is carried on and there are large granite quarries. The R. N. runs through the co. in a beautiful valley, which presents particularly attractive and romantic scenery in the neighbourhood of Cawdor Castle, one of the residences of the earl of Cawdor. Area 162 sq. m. Pop. 8500. 2. Royal (1121) municipal burgh, and co. tn. of N. It lies on the Moray Firth, and has a harbour with pier and breakwater. Fishing is the main industry. Freestone is quarried, and there are rope and twine factories. The good bathing and fine golf course have made it a favourite summer resort. Pop. 6000.

Nairne, Carolina Oliphant, Baroness (1766-1845), Scottish song-writer, b. at Gask, Perthshire. She was called the 'Flower of Strathearn' on account of her striking beauty. She wrote songs under the pseudonym of 'Mrs. Bogan of Bogan' or 'B.B.' The most popular ones are *The Laird o' Cockpen*; *Land o' the Leal*; *Charlie is my Darling*; *Caller Herrin'*, and numerous Jacobite songs. See G. Henderson, *Lady Nairne and her Songs*, 1905.

Nairobi, cap. of Kenya Colony and Protectorate, and the chief city of Brit. E. Africa. It stands at an altitude of 5453 ft. above sea level, 330 m. from the coast. It is a city of the plains, but behind it, to the W. of the line of the Ngong Hills, the character of the country beyond is clearly imaginable. N. grew out of the Kenya and Uganda Railway. When the first few stores followed the pioneer railway and a bazaar and a few rough roads appeared, it was hardly to be imagined that this was the nucleus of a new and thriving city and a new empire

cap. Yet not many years ago N. was a mere *reld dorp*, with corrugated iron buildings in the commercial area, unpaved sidewalks, and rough earthen roadways, while ragged gum-trees obscured the low shop-windows in the main street, giving the whole an untidy aspect. At that time the tn. was mostly an Indian bazaar and rickshaws were the chief means of transport. N. is in fact hardly half a century old. The train approaches the tn. from a somewhat unfavourable point. The buildings on the plains are scattered and unattractive: a quarantine hospital, the prison, the factory sites, the public works dept.'s premises, and rows of low houses provided for the African staff of the transport system. But this dreary introduction soon gives way to something far more impressive. The station is long and not unimposing, and the smoke-grimed engine-sheds and long workshop buildings suggest an industrialised setting after the unbroken peace of the plains. The new headquarters of the Kenya and Uganda railways and harbours is a fine pile set in a spacious and well laid-out site. To-day N. has wide macadamised streets, sev. modern and even luxurious hotels, theatres and picture houses, departmental stores, a cathedral, a racecourse, one or two up-to-date aerodromes, imposing supreme court buildings, and a fine city hall. The cultural life of the country is represented by a memorial library and a memorial museum. Its streets are thronged by a motley crowd of Europeans, Asiatics, and Africans of every kind and from almost every part of the continent. There is delightful country around N. and good motor roads. Visitors can arrange to go everywhere by car, train, or by air. The municipal council decided in Aug. 1919 to petition the king for a charter raising the status of the tn. to that of a city. In April (1950) N. will celebrate the fiftieth anniversary of local government there. The Royal College of Heraldry is to be invited to assist in blazoning a coat of arms, and inquiries are to be made about obtaining a mace. The petition to the king recalls that N. was originally a swampy watering place to which Massai herdsmen brought their cattle. To-day it has 120,000 inhab. (Europeans 6000), is the headquarters of both the Kenya Gov. and the E. African High Commission, and is the largest Brit. colonial tn. N. of Rhodesia. The first European resident was a sergeant of the Royal Engineers named Ellis, who in 1896 was seconded to the railway construction authorities.

Naivasha, tn. in Kenya in the prov. of N., and close to the lake of the same name. It is 39 m. distant from Mombasa. There are many farms taken up by Europeans in this neighbourhood. Some 35 m. E. of the tn. is Mt. Satima (13,000 ft.), the highest point of the Aberdare Range. White pop. is about 500.

Najd, see NEJU.

Nakhichevan, autonomous S.S.R. included in the Azerbaijan S.S.R. Also the name of its chief tn.—on the r. b. of the Don, and near the mouth of that riv., 6 m. E. of Rostov. The tn. was founded

in 1779 by Armenian settlers. Tobacco, candles, tallow, cotton goods, and bricks are manufactured. The area is served by a branch line of the Baku-Tiflis railway. Pop. (tn.) 71,300.

Nakskov, port and cap. of Laaland, Denmark. 82 m. S.W. of Copenhagen. Brewing and sugar refining are carried on. Pop. 9000.

Nakuru, tn. of Kenya, Brit. E. Africa, cap. of Rift Valley prov. It is attractively situated on the shores of a salt lake of the same name, surrounded by mts. and sloping pastures, studded with extinct volcanoes. It is a centre of the Kenya Farmers' Association. An agric. show is held annually. There are European schools. The crater of Menengai (7470 ft.) close to Lake Nakuru is visited by tourists. The crater, which is 2000 ft. deep and 8 m. in diameter, affords fine views of the Rift valley. A branch of the Kenya and Uganda railways connects Nakuru with Kisumu (134 m.). Nakuru is the point of departure for Lake Baringo (78 m. distant), a lake 18 m. long and 10 m. broad. Pop. (white) 1500; (Asiatics) 1200.

Archaeology.—Lake Nakuru was the centre of the brilliant anthropological researches of Dr. L. S. B. Leakey (see MAN), who studied at the anthropological school of Cambridge Univ. and led the E. Africa archaeological expedition to the Rift valley in 1928. He and his companions unearthed in the lake deposits at Nakuru a very complete series of Pleistocene remains, including 'pygmy' implements of obsidian, decorated pottery, stone bowls, mortars, and beads, besides human remains—the latter being the most significant. Human remains were discovered on a site at the N. end of the Nakuru basin, below the railway station of the same name, and also at two other sites some 15 m. distant at the S. or Elmenteita end of the Rift valley. The skull found by Mr. Leakey in the Nakuru deposits was remarkable for the great length in proportion to the width, and its other outstanding characteristics lay in the face, which was 136 mm. long and comparable to the Oldoway skull (see OLDOWAY MAN). Two skulls were also found by Dr. Leakey on the Elmenteita site, one resembling closely the Nakuru skull. The deposits found by Mr. Leakey in 'Gamble's Cave' in the S. end of the Nakuru basin form a wonderful series, and to find comparable examples we have to go to the Grotte des Enfants in the S. of France or Tzitzikama in the S. of Cape Prov. See Sir A. Keith, *New Discoveries relating to the Antiquity of Man*, 1931.

Nalchik, resort and cap. of the Kabardian autonomous S.S.R. of the R.S.F.S.R., in the central Caucasus. Pop. 26,900.

Namaland, see NAMAQUALAND.

Namangan: 1. Region of the Uzbek S.S.R. In the N.E. of the republic, bordering on the Kirghiz S.S.R. 2. Cap. of the above region, 50 m. N.E. of Kokand, in the Syr-Daria valley. There is trade in sheep, hides, cotton, and fruit; coalfields and naphtha beds are in the vicinity. Pop. 77,300.

Namaqua, Hottentot tribe inhabiting Namaqualand, S. Africa. Of all Hottentots they are by far the purest survivors, and are the only tribe to preserve not only the racial type, but their own language. Khoi-Khoi is the name by which they call themselves. A dictionary of the Namaqua language was pub. by Tindall in 1852.

Namaqualand: 1. Great, region of Brit. S.W. Africa, is a desert land sparsely peopled by Hottentots, lying N. of the Orange R. Angra Pequena, on the coast, affords safe anchorage. The chief activity of the region is the rearing of cattle. 2. Little, lies in the N.W. of the Cape Prov. and S. of the Orange R. There are copper mines at Ooekiep, but the region is barren and is covered with rugged volcanic-looking mts. Chief tn., Springfontein. Although the larger mammals are extirpated, there are still troops of ostriches on the grassy flats of the Bushman country. The existence of copper in N. was known in the seventeenth century and rich ore was brought to Governor Van der Stel by natives in 1681. The supply has declined in recent years. The gravel beds near the mouth of the Orange R. up to Port Nolloth are diamond-bearing. Gold was discovered on the Richterveld in 1931. Area 20,635 sq. m. Pop. 25,850.

Name Day: 1. On the Stock Exchange, prior to 1914, meant the second day of the periodical monthly settling day. On the second day a ticket, giving the name and address of the ultimate buyer, and the firm who was to pay for the stock, was passed through various intermediaries to the ultimate seller, so that the transfer of stock might be made directly. N. D. was sometimes called ticket day. Now settlements are made daily. 2. Day which is sacred to the saint whose name is borne by a person. The term is naturally used principally in Rom. Catholic countries.

Namen, see **NAMUR**.

Names (O.E. *nāma*, Ger. *name*; cf. Lat. *nomen*, Gk. *ónoma*, title by which a person, place, thing, or class of persons, places, or things, is known). *Place N.*, when scientifically studied, furnish information about the early inhab. and the state of their lands, changing modes and conditions of settlement, and alterations of geographical environment. Eng. place N. have much of pure Eng. origin, but there are important Celtic, Scandinavian, Lat., and Fr. elements. They thus embody the hist. of England, its conversion to Christianity from heathen worship, its antiquities and early defence, its institutions and social conditions, meeting-places, industries, and productions. Some riv. and stream names (Avon, Dee, Stour, Thames) are of Celtic origin, as are those of hills and forests (Brent, Malvern, Saver-nake). The great settlement of Danes which took place in the E. cos. from the end of the ninth century onward has led to the tns. and vils. of that dist. being largely derived from the Scandinavian. A common place-name termination in the Lincolnshire dist. is *-by*, the Norse for a

vil. There is a vast number of Saxon place N. in England. Common and obvious suffixes are *-ham*, *-ton*, and *-ing*. Frequently the root of the name is that of the original possessors of the land, sometimes a tribe, sometimes a family, sometimes an individual, as in the case of Anlaby (from *Anlaf*), Rowston (from *Hrof*). Rom. place-name influence in Britain was primarily military. The Lat. *castra*, a camp, appears in many forms, either alone or as a suffix (e.g. Chester, Doncaster, Dorchester). Other N. are derived from prominent local features, even from trees, as in the cases of Ashby, Lyndhurst, Aldershot, Olney, and Bromley. The investigation of the original significance of place N. may be extremely difficult, requiring an accurate knowledge of philology, for in the course of ages assimilation, corruption, and popular attempts at etymological correction have often altered the N. almost beyond recognition.

Personal N. are, in general, more easy to explain than are place N., though the hist. is more complex. Among uncivilised as well as among civilised peoples the custom obtains of giving each child a name at its birth, though among uncivilised races the name is sometimes given before this. The N. are chosen from nature, from religion, or from some event showing the circumstances of the birth. This method of naming children is well shown in the early books of the O.T. The N. of the gods of the tribe frequently form part of the N. In a later stage of development, the name loses its true meaning and the assignation of the private name of the individual depends on purely arbitrary considerations. By the time of the empire, Rom. N. were already many in number, but three of them were of special importance. The first name was purely personal and belonged to the individual. It was known as the *prænomen*. Common Rom. *prænomena* were Gaius, Marcus, Titus, Quintus. Following this came the *nomen (gentile)* which belonged to all members of the *gens* and those connected with it or adopted into it. Among patrician *gentes* the *nomen* almost invariably ended in *-ius*. The *cognomen*, or surname, was the family name, and was generally derived from some personal quality or peculiarity, as in the cases of Naso, Torquatus, Lepidus, Longulus, or from geographical considerations, as in Sabinius and Calatinus. Thus, in the case of Gaius Julius Caesar, Gaius is the *prænomen*, Julius the *nomen*, and Caesar the *cognomen*. Of these N., either the first or the last might be used alone, the first two, or the first and last, might be used in combination, but it is interesting to note that the present popular designation, Julius Caesar, is the only one that would never have been used by the Romans themselves. In addition to these three N., a fourth was sometimes given, generally in recognition of some great deed or conquest. Thus, it was by his exploits against Carthage that Scipio obtained his *agnomen*, or *cognomen secundum*, of Africanus. Similarly we have the additions

Asiaticus and Creticus. When a man was adopted into another family he took all the three N. of his adopted father and to these he added a second cognomen derived by the addition of *-anus* to his old nomen. Thus, when Gaius Octavius, grandson of Julia, the sister of Julius Caesar, was adopted by his great-uncle, he became known as Gaius Julius Caesar Octavianus. To these N. was added in 27 u.c. the name of Augustus.

At the present day the child's personal name is known as its Christian or baptismal name, having generally been given on the occasion of its baptism. During the early Middle Ages, a man had no name but this. In course of time the necessity for some further distinction arose, and a man was described according to his trade, his residence, his father's name, or some personal peculiarity. The historical novel has familiarised every one with these various types of surname, and it is not difficult to trace them in modern Eng. The prefix *at* is very common, showing a place of residence, as in the name Atwood, Atwell, Atfield. Many of the occupations which have provided us with surnames have now ceased to exist. Such are Dempster (judge), Scrivener (writer), Walker (fuller), etc. A very large number of N. are derived from the paternal Christian N., and in each country particular affixes are used. Thus, in England, we have the common termination in *-son* or simply *s.* In Ireland we have the prefix *O'* or simply *O*, in Scotland and Ireland the prefixes *Mac* and *Fitz* (Fr. *fils*), in Wales the form *Ap*, of which the *a* frequently disappears (e.g. Price from ApRhys). Surnames were very gradually introduced, and it is not until the twelfth century that they begin to become hereditary. Before and frequently after this time the surname as well as the Christian name was peculiar to the individual. Now, however, it is an established custom that the children should invariably be known by the name of the father. On the occasion of a woman marrying, it is usual for her to take her husband's surname, 'N. of dignity' (i.e. peerage ranks, 'lord' or 'sir') are not accepted by the registrar-general unless right is shown to them. Surnames in Scotland were late in becoming fixed, and owing to the clan system are much fewer than in England. The branches of the clans and houses were distinguished by a third name, which now usually survives in the designation of the chiefs and chieftains of families, e.g. 'Mackintosh of Mackintosh,' 'Cameron of Lochiel,' and these, where ordinarily used, are legally regarded as part of the surname. Women in Scotland do not lose their maiden name on marriage, but usually assume their husband's—including designation if any—and are described by both (e.g. 'Mrs. Margaret Gordon or Macdonald of Glenbracken') in legal deeds.

Change of Name.—In England N. may be changed by royal licence or by deed poll. The former is conducted by application through the College of Arms, and the deed poll is usually recorded there,

though advertisement alone is sometimes thought sufficient. In Scotland the Lord Lyon Knight of Arms has jurisdiction in this, and application for royal licence is made through him, but the cheaper course (replacing the deed poll in England) is the Lord Lyon's certificate 'officially recognising' the party under his new name (cost 15s. and expenses, payable to H.M. Treasury). See M. A. Lower, *Patronymica Britannica*, 1860; Christina Blackie, *Etymological Geography*, 1875; C. M. Yonge, *Christian Names* (new ed.), 1884; L. Wagner, *Names and their Meanings*, 1891; J. Egli, *Etymologisch-geographisches Lexikon*, 1892-93; B. E. Smith, *The Cyclopaedia of Names*, 1894; Green's *Encyclopaedia of the Law of Scotland*, s.v. 'Name and Change of Name' (the only reliable or detailed treatise on the Scots law upon this subject), 1896-1904; C. W. Burdsey, *English and Welsh Surnames*, 1901; E. Weekley, *Romanesque of Names*, 1912; C. L'E. Ewen, *A History of Surnames of the British Isles*, 1931; E. Ekwall, *Concise Oxford Dictionary of English Place-names*, 1940, 1947; E. G. Withycombe, *Oxford Dictionary of English Christian Names*, 1915; H. G. Stokes, *English Place Names*, 1919; and the co. surveys of the Eng. Place-Name Society.

Namnetes, or Nannetes. see NANTES.

Namur (Flemish Namen). 1. Prov. of Belgium, bounded on the N. by Brabant, E. by Liège and Luxembourg, W. by Hainaut, and S. by France. The prin-



NAMUR

rivers are the Meuse, which entirely intersects the prov., the Sambre, and the Lesse. To the N. of the valleys of Sambre and Meuse this prov. forms part of the fertile Hesbaye plateau. To the S. it presents an alternation of fruitful valleys and low hilly tracts; but in some parts, where the heights constitute offshoots of the

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Ardennes, and are densely wooded, they attain an elevation up to about 1650 ft. Besides coal-mines Namur has important quarries of marble, slate, sandstone, and limestone. It has good steel, iron, and smelting works which are concentrated with the industries of glass and chemicals round the city of Namur and in the valley of the Sambre. Andenne (*q.v.*) is the chief place of the ceramic manufs. in the prov.

The old co. of Namur came in 1183 under Hainaut, and in 1263 under Flanders. In 1421 it was incorporated in mighty Burgundy. In the sixteenth and seventeenth centuries it shared the historical fate of the S. Netherlands. In 1792 it came under France; was united again with Holland in 1815 and eventually became a Belgian prov. in 1830. Area 1414 sq. m. Pop. 356,000. 2. Cap. of the above prov., situated at the confluence of the Sambre with the Meuse, about 40 m. S.E. of Brussels. The city is strongly fortified and is the seat of a bishop. Its most noticeable architectural monuments are the cathedral, rebuilt during 1750-72, the belfry of the eleventh century and the restored citadel of the eighteenth century, at present laid out as a park and containing a forestry museum. Namur is noted for its cutlery, its leather works, and its iron and brass foundries. Porcelain, pottery, glass, cement, chalk, and jam are also manufactured. Namur is a very old tn. and has many times been bombarded and besieged. It was captured by the Gers. in Aug. 1914 and looted. In 1910 the new fortifications of Namur were passed by to the N. and S. Pop. 31,400. See J. Borguet and S. Bormans, *Cartulaire de la commune de Namur, 1871-1925*, and F. Rousseau, *Namur, ville mosellane, 1945*.

The prov. and tn. of Namur were in Ger. occupation between 1910 and 1914. The Amer. First Army, pouring across the Seine bridgeheads, began a spectacular drive on a three-corps front towards Namur, Liège, and the Ger. frontier (Aug. 29-Sept. 4). On the right of this front the 7th Corps crossed the Aisne on Aug. 29 and captured Namur and the Meuse crossings near Dinant on Sept. 4-5 (see WESTERN FRONT IN SECOND WORLD WAR).

Namwang, see PNOMPHNU.

Nanaimo, tn. and coal-mining centre in Vancouver Is., Brit. Columbia, Canada. 74 m. N.N.W. of Victoria. Chief exports are coal, lumber, salmon, and furs. Pop. 6,700.

Nana Sahib (1820 c. 1859). The last Mahratta peshwa, Bajee Rao (Raji Rao II.), who was deposed in 1818, and pensioned, adopted Dhondoo Punt (Dandhu Panth), also called N. S. In 1853 Bajee Rao died, and N. S. claimed Bajee Rao's estate and pension, but the latter was refused. On the outbreak of the Indian mutiny (1857) he joined the rebels, and is remembered for his treachery at Cawnpore (1859), where he caused men, women, and children to be massacred. Ultimately he was attacked and took refuge in the jungles at the foot of the

Himalayas, where he is supposed to have perished.

Nanchang, cap. of Kiangsi prov., China, situated on the R. Kan, 175 m. S.E. of Hankow. It is a railway junction, and has an extensive porcelain trade. Pop. 412,000.

Nancy, tn. of France, cap. of the dept. of Meurthe-et-Moselle, on the l. b. of the R. Meurthe, 175 m. S.E. of Paris. The anc. part of the tn. is noticeable for its narrow, irregular streets, while the modern part has broad open streets commanding a view of the surrounding hills. The handsome Place Stanislas divides the Ville Neuve from the Ville Vieille, and is surrounded by many important buildings, such as the hôtel-de-ville and bishop's palace. Other interesting features are the cathedral and the church of the Cordeliers. There is a univ., and N. is a garrison tn. In Aug. 1914 the Ger. Army reached the outskirts of the city, which was bombarded by aeroplanes and long-range guns, but the invaders were driven back in Sept. 1914. In the Second World War N. was involved in the fighting on the Rhine-Verdun-Metz axis following the allied crossings of the Meuse. The 20th (Amer.) Corps entered Verdun and crossed the Meuse (1 Sept.) reaching Étain on the road to Metz; at the same time the 12th Corps advanced to the vicinity of N. The Gers., however, then withdrew to the other bank of the Moselle and on Sept. 5 the allied corps reached N. and by the 11th had estab. themselves in strength on the E. bank of the riv. between Metz and N. See further under WESTERN FRONT IN SECOND WORLD WAR. N. is an important railway centre, and has numerous manufs. including chemicals, textiles, iron goods, and lace. Pop. 113,400.

Nanda Devi (the Blessed Goddess), peak of 25,660 ft., one of the most beautiful in the world, situated in a lofty basin in Garhwal almost impossible of access except through the very deep, difficult Rishi Gorge. Longstaff reached the rim of the basin in 1906; further attempts by him and Ruttledge and others failed to penetrate to the foot of the mt. E. Shipton and H. W. Tilman did so in 1931 but too late to make the ascent. The expedition of 1936 led by Graham Brown, with Tilman, Odell, Lloyd, Houston, Loomis, and others, was a triumph of unselfish co-operation, judgment, skill, and determination. Tilman and Odell were the two who reached the summit, the highest in what was then Brit. India as well as the highest in the world yet climbed.

Nandgaon, state of the Central Provs., India. Cap. Rainandgaon. Rice, cotton and wheat are produced. Area 872 sq. m. Pop. 202,900.

Nandi, dist. in Kenya, Brit. E. Africa. N. is also the name of a tribe of Uganda akin to the Masais.

Nanga Parbat, peak of 26,629 ft. rising 23,000 ft. above the Indus valley. In 1895 Mummery, after failing to climb the very difficult S. face, lost his life crossing to the N. side. In 1932 Willy Merkl's

party reached 23,000 ft. by a route up the Rakiot glacier below the ice precipices of the N. face. In 1934, after two nights at 25,000 ft., Merkl, Welzenbach, Wieland, and six porters perished in attempting to descend. In 1937 an avalanche from the N. face at night wiped out Wien's expedition; Bauer's expedition in 1938 found their corpses but reached no higher point.

Nankauri, see under NICOBAR ISLANDS.

Nankeen, cotton cloth of a peculiar yellow shade, which was originally manufactured in Nanking (China), but which has been imitated in other countries.

Nanking, or **Kiangning** (anc. cap. of China, later the chief tn. of the prov. of Kiangsu and the residence of the governor-general of three provs. (Kiangsu, Kungsí, and Nganhui)), is situated about 3 m. from the S. bank of the Yangtszekiang and about 100 m. from its mouth. About 1000 A.D. it was named Kiangnan, but in 1368 it received its present name, which means Southern Capital. The anc. palaces have almost entirely disappeared, and the only remarkable monuments of royalty that now remain are some sepulchral statues of gigantic size near an anc. cemetery, known as the Tomb of the Kings. Here is the famous porcelain tower, 260 ft. high, completed in A.D. 1430, octagonal in shape, each side being 15 ft. wide. N. manufs. satin and crape and the cotton cloth called after the city nankeen. Paper and ink are also produced. It was here that peace was concluded between England and China in 1842. In normal times its imports were chiefly cotton goods and metals, and its exports silk goods, frozen meat, and skins. In 1909 the railway connecting it with Shanghai (192 m.) was completed, and Tukow on the opposite side of the riv. is the terminus of a line to Tientsin, opened in 1911. This railway caused a large increase in N.'s trade. The neighbourhood is marshy, which makes the climate dangerous to foreigners who are liable to malaria. It is the seat of the National S.E. Univ. In 1928 N. was chosen to be the cap. of China in place of Peiping. In the Chinese-Jap. conflict it was bombed and attacked by Jap. infantry in 1937. It fell to the Jap. invaders on 18 Dec. 1937. The Jap. in 1940 set up a puppet gov. there but the Chinese embassies throughout the world formally disavowed it. *See further under CHINA. History. Pop. 807,000.*

Nansen, **Fridtjof** (1861-1930), Norwegian explorer, scientist, and philanthropist; b. at Store Fjøn, near Oslo. His first voyage was made in the *Viking*, 1882; his second voyage was made to Greenland in 1888, when he and his companions, Otto Neumann Sverdrup, Capt. O. C. Dietrichson, and others, encountered many hardships in their attempt to cross the great ice-field. The most remarkable of N.'s adventures was his voyage in the *Fram* to the Arctic regions, where he deliberately allowed his vessel to drift with an ice-floe as far N. as he could go, and then abandoned his ship in order to push his way further N. The *Fram* sailed on June 24, 1893. Leaving the ship, N., accompanied by Johansen, pushed across

the ice, wintered in Franz Josef Land, and was picked up by the Jackson-Harmsworth expedition in 1896. Before the First World War, he investigated sea temps., etc., between Ireland and Iceland, and made further oceanographic research beyond Spitsbergen. In 1917 he represented neutral Norway on a mission to U.S.A. about food supplies. He was a prin. pillar of the League of Nations from its estab., being chief Norwegian representative. In 1921-23 he was chief inspirer and director of famine-relief work Russia, working with Hoover. Officially thwarted in his attempt to induce the League to raise an international relief loan, he visited selected tns. in N. Europe and raised £250,000 from the public in six weeks. With this sum available, he ignored official channels, collected a small staff of skilled administrators, and, in conjunction with Hoover and his Amer., was soon feeding 10,000,000 people dying of hunger on the banks of the Volga. He was also high commissioner of the League of Nations for settlement of refugees. These refugees were composed for the most part of White Russians and later on of Gks. from Asia Minor. They were without a state or a recognised nationality, and N. provided them with a "N. passport," which was accepted by every gov. or certainly by those which were member states of the League. Lord Rector of St. Andrews Univ. in 1926, he refused the premiership of Norway. At the time of his death he was intending to go N. once more--this time by airship. Among Eng. trans. of his writings are *Farthest North* (1897); *In Northern Mists* (1911); *Through Siberia* (1914); and *Armenia and the Near East* (1928). *See lives by E. S. Stanitt, 1930; J. Sorensen, 1932; E. E. Reynolds, 1932; and C. Turley, 1933.*

Nanshan (the S. Mts.), name of a range of mts. in Central Asia, extending from the S.E. to the N.W. between Tibet and the Gobi desert. The average height of the range is over 13,000 ft., and the Humboldt spur extends for 60 m. at a height of 16,000 ft. From this spur the Titter chain extends to the Tsaidan plateau. The N. range includes the S. Koko-nor and the Semaroy ranges, and two ranges discovered and named by Prievalsky. The whole system, like the Kuenlun, is older than the Tertiary period, and has large carboniferous beds. Marine formations have been found at a height of 18,000 ft. above sea-level.

Nanterre (ancet. **Nemptodurum**, or **Nemeturum**), tn. of France in the dept. of Seine, 8 m. N.W. of Paris by rail. It has manufs. of talow and aluminium. The tn. contains the shrine of St. Geneviève (420-512), the patron saint of Paris; pilgrimage takes place hither in Sept. Pop. (com.) 27,000.

Nantes (ancet. **Namnetes**, or **Nannettes**), seaport city of France, cap. of the dept. of Loire-Inférieure, is situated on the r. b. of the Loire, 30 m. from its mouth. The natural beauties of the site have been much improved by art, and now the riv. on which the tn. is placed, covered with

craft of every size and description, the is. that stud its channel, and the bridges that cross it and its trib. here, combine to make the scene a highly picturesque one. The tn. possesses numerous striking and beautiful buildings; among which the cathedral of St. Pierre (severely damaged in the Second World War), containing the splendid monument of Francis II., the last duke of Brittany, and of Marguerite his wife, and the old castle, built in 938, are the chief. Within recent years much has been done by dredging for the improvement of the riv. bed, and large vessels can now reach the harbour, which is fairly spacious. The chief manufs. of N. are varieties of linen and cotton fabrics, calicoes, flannels; refined sugar and salt, soap, chemical products, cordage, sardines, preserved fruits, and meats, etc. It contains shipbuilding yards, tanyards, copper foundries, brandy distilleries, tobacco, biscuit, and sugar factories. Henry IV. signed the famous Edict of N. here in 1598. N. was in Ger. hands from 1940 to 1944, and during this time suffered heavy damage from bombing. Following the allied break-through in Normandy in July (1944) the Amer. Third Army advanced into Brittany against negligible resistance, and by Aug. 6 an infantry div. reached the Loire between N. and Angers. N. itself fell to the Amer. on Aug. 10, although part of the city S. of the riv. remained in Ger. hands for some weeks later. Pop. 200,200.

Nantes, Edict of, see EDICT OF NANTES.
Nanteuil, Robert (1623-78). Fr. engraver, b. at Rheims. Setting in Paris he was appointed in 1658 designer and engraver to the king, with a pension. He modelled his works with great exactness, according to nature, and gave them marked individuality. Among his finest portraits are those of Mazarin, Pomponne de Bellièvre, Turenne, Jean Loret, and Anne of Austria. See life by E. Douvy, 1924.

Nantgarw, vll. of Glamorganshire, Wales, in the valley of the Taff, 5 m. from Cardiff. It gives its name to a variety of china produced here by Samuel Walker and his father-in-law, Wm. Billingsley, in 1811. It was a hard paste porcelain and had a good glaze, but was vitreous and hard to fire. Billingsley, with the assistance of Wm. Weston Young, continued his work at N. until 1819 when he sold his factory to Young. The decoration at the pottery itself, mostly by Billingsley and Young, consisted of paintings of birds and flowers in bright colours. Generally there were bouquets in the centres, surrounded by elaborate borders enclosing small panels painted with single flowers.

Nantucket, tn. and co. seat of N. co., Massachusetts, U.S.A., on the is. of N. (51 sq. m.), 28 m. S. of Cape Cod Peninsula. It is chiefly important as a summer resort, but has also a large whaling fishery. N. has an interesting hist. from the time of its first settlement by Thomas Macy in 1659. The old name of N. was Sherburne, the present name being given in 1695.

Pop. 3400. See A. Starbuck, *History of Nantucket*, 1924.

Nantwich, markt. tn. in Cheshire, England, on the Weaver, 5 m. S.W. of Crewe. There are some old timber houses of the sixteenth century. The tn. is visited for its brine baths. There are tanneries, flour-mills, iron foundries, and manufs. of boots and shoes and textiles. N. was a barony of the Norman earl, Hugh Lupus, who built a castle there for defence against the Welsh. No ruins of this castle remain. Twice in the first half of the twelfth century the Welsh invaded the tn., and Henry III. later closed the brine-pits in order to remove the main cause of their incursions. At that time N. alone produced more salt than all the other salt-pits in Cheshire. In the early fifteenth and late sixteenth centuries N. was largely destroyed by fire, and thrice between 1587 and 1604 it was decimated by plague. Hence there are but few houses still to be seen standing of a date earlier than Thomas Cleese's house, called the pre-Armada house, with its rhymed tribute to Queen Elizabeth, who made a grant of timber from the royal forest of Delamere for the rebuilding of the tn. Pop. 7100.

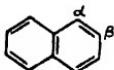
Nantyglo, tn. of Monmouthshire, Wales, 7 m. W.S.W. of Abergavenny. It is part of the dist. of N. and Blaina and has coal-mines and ironworks. Pop. (with Blaina) 15,000.

Napa, see NABA.

Naphtha, term originally applied to the liquid hydrocarbons in the neighbourhood of the Caspian Sea (the *naphtha* of the Assyrians and the *naphtha* of Dioscorides). The natural oils of other countries became included under the term, which has now been restricted to the mixture of low-boiling hydrocarbons obtained in the fractional distillation of petroleum, coal-tar, and shale oil. The paraffins are petroleum Ns., and olefines and paraffin are obtained from shale oil. Coal-tar N. collected up to 170° C. is a crude light oil which is redistilled fractionally for 'solvent N.' or 'burning N.' which consists of xylene, pseudocumene, etc. All these Ns. are volatile, highly inflammable liquids, with the odour of benzene, and are valued as burning oils and solvents for gums, resins, etc. Wood N. is crude wood-spirit, or methanol (*q.v.*).

Naphthalene ($C_{10}H_8$), aromatic hydrocarbon, occurs in coal tar. Crude crystals of N. are obtained by fractional distillation of coal-tar between 170° and 230° C. These are treated with sulphuric acid, and pure N. is finally obtained by distilling in steam. It crystallises in large lustrous plates, melts at 79° C., and boils at 218° C., and has a sp. gr. 1.15. It has a characteristic odour, is extremely volatile, is insoluble in water, but is readily soluble in hot alcohol and ether. As its vapour burns with a highly luminous flame, N. is sometimes used for carburing coal gas, but its chief use is for the manuf. of derivatives which are used as dyes and explosives. It is the starting point for preparing synthetic indigo. N. is also used as a mild antiseptic and insect killer.

On oxidation with dilute nitric acid, phthalic acid is formed, proving that N. contains the benzene group, and its constitution has been shown to be that formed by the condensation of two benzene rings. Two classes of derivatives are formed, called α or β according to the position of the entering groups. N. forms a characteristic crystalline derivative with picric acid.



NAPHTHALENE

Hydrocarbons and their monologues of the N. series are also found in sev. types of petroleum. The method of producing from petroleum is similar to that used for obtaining N. from coal tar. The action of heat greatly alters the chemical composition of petroleum hydrocarbons and at more or less red heat N. is produced. It is prepared commercially in crystals, flakes, balls, powders, etc. Natives of India and the Far E. carry it in the shape of sticks as a fever preventive.

Naphthionic Acid, member of the group of naphthylamine-sulphonic acids. It is used in the dye industry, while other members are employed in the synthesis of drugs to combat sleeping sickness and similar trypanosomal diseases (e.g. in the drug known as Bayer 203).

Naphthol ($C_{10}H_7OH$). The two Ns. (α and β) are monohydroxy-derivatives of naphthalene corresponding to the monohydric phenols, which they resemble in properties, and are used as sources of dyestuffs; a N. (melting point, 95° C.; boiling point, 282° C.) is prepared from α -naphthylamine, and is a colourless crystalline substance with a faint smell, soluble in alcohol and ether, but sparingly soluble in hot water. The β variety (melting point, 122° C.; boiling point, 288° C.) is soluble in water, its solution giving a green coloration to ferric chloride, while the α compound gives a violet coloration.

Naphthylamine, or Amido-Naphthalene ($C_{10}H_7NH_2$), occurs in α and β modifications; α -naphthylamine is a colourless crystalline substance with a disgusting smell (melting point, 50° C.; boiling point, 300° C.), prepared by reducing α -nitro-naphthalene. The β compound prepared from β -naphthol is odourless (melting point, 112° C.; boiling point, 288° C.). Both varieties and their derivatives are extensively employed in the manuf. of dyes.

Napier, Sir Charles (1786-1860), Brit. admiral, cousin of Sir Charles James N., b. near Falkirk. He entered the navy in 1800, and took part in the operations in the W. Indies in 1808-9. In 1813 he went to America on the expedition up the Potomac, and was put in command of the *Ganthea* off Portugal, 1829. In 1833 he was asked to take command of the Portuguese fleet, with which he was victorious off Cape St. Vincent. In the Syrian war

of 1940 he stormed Sidon, and in 1854 was commander-in-chief in the Baltic against Russia. He twice sat in Parliament; for Marylebone (1842-46), and for Southwark (1855-60). See Maj.-Gen. E. Napier, *Life and Correspondence of Admiral Sir Charles Napier, K.C.B.*, 1862.

Napier, Sir Charles James (1782-1853), Brit. general and statesman, b. in London. He fought in the Irish rebellion (1798), in Denmark (1807), and was wounded and taken prisoner at Corunna (1808). He returned to the Peninsula in 1811, took part in the expedition to Chesapeake (1813), and after peace was signed became governor of Cephalonia (1818). In 1841 N. was dispatched to India, and two years later won a great victory at Meceano, by which he subdued the rulers of Sind. His administration there was described by his brother, Sir W. P. F. Napier (1851), who wrote his life (1857). He himself wrote many books, chief of which *Colonisation* (1835), and *Defects, Civil and Military, of the Indian Government* (1853).

Napier, Sir Francis, ninth Baron Napier, first Baron Ettrick of Ettrick (1819-98), Brit. diplomatist, b. at Thirlestane in Selkirkshire. He began his career, in 1840, at Vienna and Constantinople, afterwards being sent to the U.S.A. and then to The Hague. From 1860 to 1864 he was ambas. at St. Petersburg, and from 1864 to 1866 at Berlin. In 1866 he became governor of Madras. After a temporary appointment as governor-general of India he returned to England.

Napier, John (1550-1617), Scottish mathematician, the inventor of logarithms, was b. at Merchiston Castle, near Edinburgh, and educated at the univ. of St. Andrews and on the Continent. In 1611 he pub. his invention by which sines, tangents, etc., may be briefly calculated in his treatise, *Mirifici Logarithmorum Canonis Descriptio*. Three years later he wrote *Rabdologia seu Numerationis per Virgulas libri duo*, describing an ingenious method of multiplying and dividing, known as 'N.'s bones,' or 'rods.' N.'s *Plaine Discovery of the whole Revelation of Saint John* (1593) enjoyed great popularity during his lifetime.

Napier's Bones. Previous to his invention of logarithms N. had devised a simple system of multiplication by means of rods known as 'N.'s bones.' The way in which they were used is illustrated by the accompanying figure that shows the 'bones' arranged for the multiplication of the number 85723. Each of these bones consists of the multiplication table from 1 to 9 for the particular number at its head. The digits are engraved below the diagonal in each square and the tens above it. The strip numbered from 1 to 9 is placed on the left in the position shown. As an example we may multiply 85723 by 5. Beginning at the extreme right of the row opposite 5, we write down the numbers in order, adding the number above a diagonal to the one below the diagonal in the column to the left of it. We thus obtain the answer 428615. In order to multiply 85723 by 7024 (say), the

above process is repeated for each number in the multiplier and the answer is obtained by appropriate addition thus:

$$\begin{array}{r}
 342892 \\
 171446 \\
 511338 \\
 600061 \\
 \hline
 653552152
 \end{array}$$

See lives by the earl of Buchan, 1787, and by M. Napier, 1834; and an article by W. R. Macdonald in the *Dictionary of National Biography*.

	8	5	7	2	3
1	8	5	7	2	3
2	1	1	1		
3	2	6	0	4	4
4	3	4	5	2	6
5	2	0	3	1	1
6	4	8	0	5	0
7	5	6	3	4	2
8	6	4	0	5	1
9	7	2	4	6	3

NAPIER'S BONES

Napier of Magdala, Robert Cornelis Napier, first Baron (1810-90), Brit. soldier, b. at Colombo, Ceylon. He served with distinction through the two Sikh wars, was present at the relief of Lucknow, and afterwards defeated Tanta Topi on the plains of Jaura Alipur. In 1868 he was put in command of the Abyssinian expedition, and on account of his brilliant services at the storming of Magdala was created a peer. Subsequently he was appointed commander-in-chief of the forces of India (1870), governor of Gibraltar (1876-82), and constable of the Tower (1886). He was made field-marshall in 1883. *See* memoir by R. MacLagan, and H. D. Napier, *Field Marshal Lord Napier of Magdala*, 1927.

Napier, Sir William Francis Patrick (1785-1860), Brit. soldier and historian, a younger brother of Sir Charles James N., b. at Celbridge, near Dublin. He joined an Irish regiment in 1800, and subsequently fought in Denmark (1807) and in the Peninsula (1808). His *History of the War in the Peninsula* (6 vols., 1828-40) is a classic. His other works are *History of the Conquest of Scinde* (1845); *History of Sir Charles Napier's Administration of Scinde* (1851); and *The Life and Opinions of General Sir C. J. Napier* (1857). *See* life by Lord Aberdare, 1862.

Napier, seaport and winter resort on the

E. coast of North Is., New Zealand, on Hawke's Bay, 200 m. N.E. of Wellington by rail. It has a good harbour, Port Ahuriri, protected by a breakwater. Large quantities of wool, meat, pelts, fruit, and canned foods are exported. N. is the third largest export port in New Zealand. Large industrial and residential areas are being developed and new industries are being estab. Pop. 20,200.

Napier's Bones, or Rods, see NAPIER, JOHN.

Naples (It. Napoli; anc. Neapolis): 1. Prov. in Campania, Italy. It occupies a coastal plain of the R. Volturno overlooking the Tyrrhenian Sea, and is backed by the Matese Mts. of the Apennines. Its climate is almost tropical, yet salubrious, but with the drawback of a dry summer; it is extremely fertile, and its people are hard-working and frugal. Olive, vine, chestnuts, corn, hemp, and cotton are grown; besides shipbuilding, there are manufs. of machinery, chemicals, motors, lace, cotton, paper, chocolate, musical instruments, etc. Area 351 sq. m. Pop. 1,360,000. 2. Tn. situated on the bay of Naples, is the third largest in Italy. Its pop. (977,900) exceeding that of all other cities excepting Rome and Milan. It is, moreover, the largest port, its shipping exceeding that of Genoa by some 500,000 tons, and with Spezia and Venice shares the naval defence. The univ., founded in 1224 by Frederick II., is one of the oldest of Italy, and now the largest in the country, being attended by more than 12,000 students in 1938-39 (including students of schools for commercial education, of agriculture, the engineering colleges, the schools of architecture, and veterinary colleges, and schools for teachers, the higher naval college, and the schools for oriental languages at the univ.). In the Second World War the univ. library was deliberately burnt by the Germans, and all its contents were lost. It lies some 100 m. S.E. of Rome, with which it communicates by means of 125 m. of railway. Since 1881, after a bad outbreak of cholera, the tn. has been vastly improved, the old tn. being demolished, redramed, and rebuilt. The Museo Borbonico, built in 1586, contains the Farnese collections, large numbers of Rom. and early It. antiquities. The Museo Nazionale contains bronzes and other objects from Herculaneum and Pompeii and many important pictures. In the war these were stored for safety at Monte Cassino and elsewhere with the result that it was afterwards found that a number of treasures were missing, including the large bronze statues, 'Two Deer' from Herculaneum, and the 'Apollo' from Pompeii, besides paintings by Breughel (or Brueghel), Claude Lorraine, Raphael ('Madonna of the Divine Love'), Titian ('Danae') and 'Portrait of Lucrezia'). There are many libraries, including that of the Club Alpino. The marine biological station is one of the finest in Europe.

Among its buildings are the Castel Nuovo, 1283; the castle of St. Elmo, 1343;

the royal palace, 1600, enlarged and furnished as a summer residence in 1900; the Castel Capuano; the cathedral of St. Januarius, completed in 1318; sev. fine churches, and many theatres, notably the San Carlo, rebuilt after the fire in 1816. In the Second World War the Castel Nuovo was damaged by numerous bomb-hits, especially the S. Giorgio tower, but the triumphal arch and bronze doors were saved by being adequately sandbagged. The royal palace sustained a score of direct hits and was badly damaged, but considerable repair work was soon effected and all the important books of its library had been moved away for safety. The Castel S. Elmo suffered slight bomb damage. The cathedral was

sculptured tombs by Rossellino and Benedetto da Maiano were saved. The original church of the name of Monteoliveto was, in fact, destroyed by an earthquake in 1805, but at the request of the Confraternity of the Lombards, Ferdinand IV., Bourbon king of N., sanctioned the transfer of the cult to the nearby church of Monteoliveto and, in popular usage, the name too was transferred. Some traces of the original Gothic structure remained, but inside, as with most medieval Neapolitan churches, it underwent a complete transformation, notably at the hands of a local architect, Gennaro Sacco. The chief glory of the church however, was not in its architecture but in its monuments and fittings of



THE PORT OF NAPLES AND VESUVIUS

E.N.4

severely shaken, but by 1946 the walls and vaults had been consolidated and the roof repaired. Some twoscore of the other churches of N. were damaged, the most regrettable loss being that of S. Chiara, built during 1310-49 by Robert the Wise, and filled with the monuments of the kings of the Angevin dynasty, which he founded. Behind the high altar was the magnificent Gothic tomb of King Robert himself, designed by Paolo and Giovanni Bertini. The church was completely burnt out by incendiary bombs and the works of art destroyed were fourteenth-century Florentine bas-reliefs of the 'Life of S. Caterina'; tomb of Maria di Calabria by Tino di Camaino; two fourth-century sculptured columns from the 'Temple of Solomon,' and a sixteenth-century tomb of Antonio Gaudino; while partial destruction was wrought to the tombs of Robert d'Anjou (by the Bertinis), Charles, duke of Calabria (by Camaino), and Marie de Valois (by Camaino). The church is to be restored in its original Gothic form. A direct bomb-bit in a Ger air raid on March 15, 1944, on the Chiesa di Monteoliveto (S. Anna dei Lombardi) destroyed the doors, porch, and campanile, but the

the Renaissance. The remarkable series of intarsia panels by Giovanni da Nola were not damaged, but the carved doors which were by the same artist were shattered. The Chiesa dei Girolomini, a baroque building with frescoes by Solimena and Giordano, was badly hit and the roof half demolished; Il Gesù Nuovo, a fine Renaissance church with rich baroque interior adorned with frescoes by Solimena, Ribera, and other seventeenth-century painters, was badly damaged, the altar being wrecked, but the façade escaped; a bomb pierced the roof of S. Domenico Maggiore and damaged the chapels, while paintings by Titian and Caravaggio disappeared and the tomb of Cardinal Filippo Spinelli was wrecked; S. Pietro Martire, founded in 1294, but completely remodelled in 1750, suffered the loss of its roof, the nave was entirely burned and other serious damage was sustained; S. Lorenzo Maggiore, a thirteenth-to-fourteenth-century church, with later alterations, was in process of restoration before the Second World War, and its poor condition was further endangered by near misses, but it was not hit; direct hits destroyed the roof, choir, main altar, and

half the ceiling by Stanzione of the church of S. Paolo Maggiore; other churches more or less severely damaged were della Croce di Lucca, S. Agnello a Caponapoli, S. Agostino della Zecca, SS. Annunziata, SS. Apostoli, S. Maria del Carmine, S. Eligio, S. Giovanni a Carbonara, S. Gregorio Armeno, and S. Maria Regina Coeli; but in all cases considerable repairs were effected as early as 1946 (see Dr. Bruno Molajoli, *Per i Monumenti d'Arte danneggiati dalla Guerra nella Campania*, 1944).

The library of the Royal Society, rich in rare books, was completely burnt and destroyed by the Germans, and the building of the Brancacciana library, also, was damaged by bombing.

Originally a Gk. colony named Parthenope, a new tn., Neapolis, was built by a later colony. N. was captured by the Romans in 326 B.C. and became a resort of the upper classes on account of its Gk. culture and climate. Virgil composed the *Georgics* here, and was buried at Posillipo. It was taken, A.D. 336, by Bellisarius, recaptured by Totila in 512, and again taken by Nurses in 553. It remained under the E. empire till 572, became a duchy in the beginning of the eighth century, and cap. of the kingdom of N. in 1139, under Norman rule. It was a bone of contention 'twixt the houses of Anjou and Aragon, which gave rise to important movements in European hist. from the thirteenth to the sixteenth century. Its hist. was closely knit with that of Sicily (the two kingdoms being finally united in 1501), until both were absorbed into the united It. kingdom under Victor Emmanuel in 1861.

In the Second World War the R.A.F. made its first raid on N. on Nov. 1, 1940, and another raid followed on Jan. 1, 1941. In 1942-43 there were frequent and heavy raids. The fact that it was not only a seaport but a railway and industrial centre made N. particularly vital and drew upon it damaging blows. It was raided by heavy bombers on the night of June 20, 1943 and by Fortresses the following day, and yet another heavy blow struck it on the night of June 26. The damage to the port and the partial destruction of the royal arsenal seriously impaired its effectiveness, but did not save it from repeated blows after the allied invasion of Italy was launched, for these were part of a co-ordinated plan of destruction against the supply and communications system of the It. mainland. By the beginning of Sept. N. had been practically isolated by bombings of the key railway junctions surrounding it, and on Sept. 9, the day after the It. armistice, the Allies landed at Salerno, within striking distance of N. The announcement of the armistice was timed for the eve of the Salerno landing in the hope that it would enhance the element of surprise, but the Germans had made their dispositions on the assumption that further It. aid or co-operation was not to be expected, so that the eventual defection of their ally had little immediate effect on the struggle for the beaches and for N., the greatest prize of Rome. By Sept. 20 the Allies

were in a position for a general advance which in a few days became a full-scale offensive. The Fifth Army, wheeling on Salerno, created a front along the Sorrento ridge which covered the approaches to N. and in the centre and along the E. coast the Eighth Army (q.v.) prolonged this sweeping movement which soon threatened to outflank Naples from the N.E. After the Eighth Army had captured the railway junction and air base of Foggia, the Germans abandoned hope of holding N. and concentrated on gaining enough time to make the port as useless as possible to the Allies. To the damage already done in the city by allied bombs the Germans added a systematic destruction which wrecked docks and buildings and public services and tried to block the harbour with sunken ships. For six days the German rearguard clung to positions along the Sorrento ridge against the increasing pressure of Gen. Mark Clark's Fifth Army. But on Sept. 22 the Allies broke through at Novara and took Castellammare, thus opening the way for a drive along the coastal road toward N. and an advance on the right wing northward towards Benevento. On Sept. 30 the latter force took the road junction of Avellino and on the following day N. fell to the Allies. See C. E. Clements, *Naples, the City of Parthenope, and its Environs*, 1894; A. Norway, *Naples, Past and Present*, 1901; E. Lemonon, *Naples*, 1919; C. Headlam, *The Story of Naples*, 1927; B. Croce, *Storia del Regno di Napoli*, 1929; H. Belloc, *Naples*, 1932; and G. Lefebvre, *Naples*, 1935.

Naples, Bay of, fine deep semicircular sweep of some 50 m. from the Is. of Ischia round to that of Capri, with a low promontory to the N., a mountainous one to the S., while Vesuvius completes, within the bay, a view famous for its beauty.

Naples, Kingdom of, existed from 1138 to the middle of the nineteenth century. For a time it was ruled by the sovereigns of Sicily. In the sixteenth century it became a possession of the kings of Aragon and Spain, having previously been ruled in turns by the Hohenstaufens and the Angevins. In 1713 it passed to Austria under Charles VI. It was ruled by members of the Bourbon family between 1738 and 1806 and again between 1814 and 1860. After the liberation of Italy by Garibaldi it became part of the Sardinian kingdom (1860), which latter kingdom ceased to exist when Victor Emmanuel was crowned king of Italy in 1861.

Napoleon I. (Bonaparte) (1769-1821), emperor of the Fr., was b. on Aug. 15 at Ajaccio, in Corsica. The date of his birth has been the subject of considerable dispute, but from actual quotation from the diary of his father we are able to fix it definitely. (For details of his family, see the article *BONAPARTE*.) The early life and characteristics of the boy marked him out for a military career. His father, who had at first supported the Paulists, was now on good terms with the Fr. governors, and was able to obtain for N. a place at the king's expense in the school at Brienne. Here he was entered as a pupil in 1779.

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His school days were far from being the happiest of his life, and his character here showed itself in its moroseness and its sullenness. It was the greatest grief of his schoolboy life that every one around him was of the conquering race, because deep down in N. was the feeling that the Corsicans would ultimately win their freedom, and he had the Corsican cause at heart. He did not show any very striking ability, but was proficient in mathematics besides showing steady application to his studies generally. In particular, he spent a good deal of his time in reading history.

In 1785 he proceeded as a cadet to the military school at Paris, and here he studied with greater zest, since he wished to enter the artillery, and was anxious for



NAPOLEON AS FIRST CONSUL
Part of L'abey's celebrated portrait.

the arrival of the time when he should be able to commence the rebuilding of the family fortunes. In 1785 he was gazetted to a regiment of artillery at Valence, and in Jan. of the following year he commenced his duties as a lieutenant. The death of his father had left him the head of the family, and during the years which followed the beginning of his military career he spent his furloughs in Corsica. He paid two visits to that Is., in 1790 and 1792. On his return to Paris in 1792, he had exceeded his furlough by some four months and taken an active part in the Paolist movement. But the breach between himself and Paoli quickly widened after this, and, trusting to the disturbed state of France, he returned there finally, in May 1793, taking his mother and sisters to Marseilles but going to Paris himself to find active employment. His judgment of the state of Paris was not wrong. Although by his absence he had forfeited his position, the revolutionary party could not afford to lose its trained officers, and so N. was reinstated and received arrears of pay. He was known, too, to be a good artillery officer and was given the rank of Lieutenant-colonel in 1793 and sent to Toulon, which

was at that time holding out against the Convention and supported by an English fleet under Lord Hood. At this time the fortunes of the republic were at a very low ebb, a fact fully realised by N. In addition to wars with hostile external powers, France had also to fight against powers within. The royalists at Toulon had admitted the Eng. and the Spaniards, and N. was called in to help the besieging forces. Here he undoubtedly laid the foundations of the great military reputation he was destined to enjoy for all time. He introduced new methods of artillery attack, and ultimately he was mainly responsible for the withdrawal of the hostile fleets and the recapture of the town. A number of his future generals were present with N. during this campaign. He was made a general of a brigade at the end of 1793, and appointed to the command of the artillery of the army of Italy in the following year, but becoming an object of suspicion with the gov., he was recalled to Paris, arrested, and his name struck off the army roll. But great influence was brought to bear on his behalf and he was soon released.

For a short while he remained in straitened circumstances and obscurity and, at one moment, entertained the idea of offering his services to the Turks. But the Parisian insurrection of Oct. 1795 caused him to change his plans. His opportunity had come once more, from the very difficulties of the gov. themselves. The populace of Paris, angered by the work and methods of the Convention, determined to get rid of that body. The Convention, liable to be attacked at any moment by the National Guard, entrusted their defence to Gen. Barras, and he chose as one of his chief subordinates the lately disgraced general N. The famous Oct. 5, 1795, can really be taken as the first step in the rise of N. to the empire. His artillerymen commanded all approaches to the Tuilleries, and their fire swept the streets. N.'s famous 'whiff of grapeshot' prepared the way for the restoration of the empire in 1804. The immediate result of the crushing of this rising was the imposition of a new constitution, the First Directory, which was still, however, essentially democratic, but which prepared the way for the ultimate changes which led to the foundation of the empire. The Convention rewarded him by making him general of div. In the next year he married Josephine, widow of the viscount de Beauharnais, who had lost his life during the Reign of Terror; and shortly afterwards he received the command of the army of Italy (Jan. 1796). He appears to have owed his promotion partly to his wife, although it is true that his plans for the It. campaign had been accepted by the Directory.

The opening of that campaign marks a new era in the hist. of the republic. Hitherto the wars had been fought by the Fr. for what they considered were the principles of the revolution; now all that was to cease, and the armies were given a material incentive in the prospect of spoil and plunder. Thus N. was able to

strengthen his position at the cap., to which he sent huge sums of money and priceless gifts which he had exacted, not as plunder, but as the natural spoils of the conqueror. His It. campaign is also in many respects his most brilliant, but, according to Tolstoy, N.'s success was due to the brilliant personnel of the It. forces and the unwillingness of his opponents to fight him. It was noted for the dashing energy and the untiring manner in which all attacks were carried out. Further, everything was carefully planned, nothing was left to mere chance. The two main features of the whole campaign were rapidity and accuracy. N. certainly fostered a spirit of revolution in the northern It. states. That spirit was to

Austrians, driving them back to Leoben, where negotiations for peace were opened. But the negotiations dragged on for some considerable time owing to the possibility of another revolution in France. The Moderate party was becoming powerful, the Royalists were beginning to take heart again. Hope ran high in Austria. But the Directory called upon N. once more, and he, piqued by an attack made on him by the council, and only too ready to do anything to further his power, came to their aid. The Tuilleries were surrounded, the obnoxious representatives were arrested, the power of the Directory was saved. N. had strengthened his own position, and had gone one step further towards empire. The Austrians no longer held back, the treaty of Campo Formio was signed, Lombardy was added to the Cisalpine Republic, and Venetia was handed over to Austria. N. could now pursue the plans which he had always had of a campaign in the E. Almost immediately after the signing of the treaty, N. returned to Paris. So clearly had he shown his power that the Directory was concerned with one thing only, and that was to get him away again as soon as possible. He was placed in command of the army intended for the invasion of England, but he himself had resolved to go to Egypt. Why he was so intent on Egypt does not seem altogether clear, but affords a glimpse of his character, as a visionary of boundless aspiration. However, the Directory fell in with his plans and he embarked his army of England for Egypt. He just escaped Nelson in the Mediterranean, captured Malta, then in the possession of the Knights of St. John, and sailed to Aboukir Bay. Swiftly he landed his troops, the terror of Nelson still on him, and marched against the Mamelukes, whom he defeated. Then came the news of the battle of the Nile, and he determined to attempt an invasion of Syria—whether he actually contemplated invasion of India, in imitation of Alexander the Great, will never be exactly known—and to return to Europe via the waters of the sultan. His campaign in Syria was successful until he reached Acre; this, chiefly owing to Sir Sidney Smith, he failed to take, and thence he returned to Egypt. Here news of the republic greeted him, and leaving the army in command of Kléber, he sailed for France, landing there some six weeks later. The news from France was not, from the point of view of that country, encouraging. The war in Europe was gradually going against the Fr., the work of the It. campaign of N. had been well-nigh undone by the second coalition, and the Directory was tottering to its fall. It was, therefore, necessary to adopt drastic measures, and in the preparation of these he had the co-operation of Sieyès on his return to the cap. N.'s journey to Paris had been one of complete triumph. He was popular and he was fawned upon by all the chief men of the state. Yet for a moment he hesitated, and his actual *coup d'état* would probably have failed had it not been for his brother Lucien.

THE EMPRESS JOSEPHINE

help him in his campaigns, and later in the war, when, threatened by an overwhelming Austrian army, he was able to depend upon an It. legion. Slowly but surely he drove back the Austrians and Piedmontese. From the neighbourhood of Savona he drove them back across the Adda, and finally, after the victory at Arcola, across the line of the Adige. The Austrians having thus been hopelessly defeated, the northern It. states formed the Cisalpine Republic. During the whole of this period N. was the servant of the Directory, but, as has already been pointed out, the spoils of Italy gave France and the Directory a new idea of warfare, a warfare that paid for itself and had enough left to supply magnificent presents to the republic, and in proportion to the plunder so did the favour of N. grow. He was able to a very great extent to act independently of the Directory, to make his own terms, to set up his own forms of government, to depose, and to treat with the princes of the lands conquered.

N., together with his ever-victorious army, now continued his war against the



the president of the Council. He it was who kept the plot in view even when N. had been unnerved, and brought the soldiers to his aid. The constitution perished, even as it had sprung into existence, by the sword. The new constitution gave the power into the hands of three consuls, the first consul, N., being the head of the state, with practically all the power, the other two (Cambacérès and Lebrun) being mere figureheads.

N. was now the ruler of France; this was the third step in the direction of empire. The popular feeling was on his side. Liberty was to be restored, the days of the old republic were to be revived. The insurrections in the country were immediately put down, and overtures of peace held out to Austria and England; the first impression was to be of a N. aiming at peace for his country, not universal empire. Now he determined upon a campaign which should bring glory to his name, and thus add to the security of his tenure of power. The campaign against the Austrians ended with the battle of Marengo, which the Austrians, after virtually gaining victory, lost owing to the magnificent cavalry charges of Kellerman. Hohenlinden, a victory of Moreau, followed. Then came the treaties of Lunéville (1801) and Amiens (1802), and also the concordat with Rome. Between the election of N. as first consul and his election as first consul for life practically the whole of the old civil institutions of France were restored. N. had established his power in France by virtually dictating peace to the world; now he was to become the sole ruler of France. In Aug. 1802, as reward for the peace, N. was created first consul for life.

From that moment, the object of peace having been accomplished, N. was again anxious for war—war almost at any price. His aggressions in Europe soon led to the resumption of hostilities with England, and he thereupon seized Hanover and prepared the way for the policy of aggression which he was about to adopt towards Germany. In 1804 he caused himself to be declared emperor of the Fr., position for which he had long been preparing the way, and which, having got rid of all possible dangers, he now thought fit to assume. His gigantic preparations for the invasion of England were finally abandoned after the battle of Trafalgar (1805), but his policy of aggression had made possible another coalition, and having struck his camp at Boulogne, just before Trafalgar, he was soon to shake Europe by his land victories against Austria and Prussia. Violating the neutrality of Prussia, he overwhelmed the Austrians at Ulm and marched into Vienna (1805). The Austrians and Russians, impatient of delay, and not waiting for reinforcements from their Prussian allies, were struck down at Austerlitz (1805). These two blows killed Pitt, established the empire of N., overthrew the ancet. Holy Rom. Empire, and established the confederacy of the Rhine under Napoleonic influence. Peace negotiations were broached but failed. Prussia, stung by

her contemptuous treatment by N., appealed to arms, but was crushed and disheartened by the terrible blows of Jena and Auerstadt. Again at Eylau (Feb. 1807) and at Friedland, in the same year, he routed the combined Prussians and Russians, and the Tsar Alexander was compelled to sign the peace of Tilsit. Prussia, broken and dismembered, did not again rise until the end was in sight. The continental system by which N. sought to conquer Britain was in full force. He himself was the dictator of Europe, the conqueror of the Hapsburgs, the equal of the anet. line of emperors.

His star had indeed reached its highest point, but, thereafter the progress of his decline is to be traced in three facts: first the attempted annexation of Spain; secondly, the invasion of Russia; thirdly, the rising of the powers of Germany against him. In 1808 he compelled the Sp. king to abdicate and placed his brother Joseph on the Sp. throne. This led to war with Spain, a war in which the national spirit of the Spaniards was aided by the arms of England, and which for the rest of the period occupied a fair proportion of the Fr. troops. The defeat and capitulation of Dupont at Baylen and of Junot at Cintra mark the beginning of the wane of N.'s ascendancy. But he was yet to win many remarkable victories. The Austrians were defeated at Raab and then at Wagram, and in 1809 peace was again signed, but the fact that the terms were prejudicial to Russia sowed the seeds of further trouble. In April 1810 N., having divorced Josephine who had given no heir to the empire, married the archduchess Maria of Austria, and a son was born in the following year, to whom the title of king of Rome was given. The economic difficulties caused by N.'s attempt to exclude Brit. goods from Europe still further exasperated Russia, and in 1812 N. decided to invade that country. His star was indeed setting; the N. of the Russian campaign was not the N. of the early days of the century. His army reached Vilna. He hesitated and then went on. He defeated the Russians at Smolensk; again he hesitated, yet again he went on, and reached Moscow, where he stayed until Oct., the tn. being in the meantime burned by the Russians. It was then that he resolved to retreat from Moscow, and although the retreat was actually carried out, five-sixths of the army he had taken with him perished. The next move was a virtual coalition of all nations against N. Russia and Prussia, then most of the Ger. states, and finally Austria, were in alliance. The allies, with troops numbering 500,000 men, now turned to face N., the morale of whose army was now low. The allies held their own, now inflicting a defeat, now sustaining one, until the great contest at Leipzig, which crushed N. and drove him back across the Rhine. The Rhine Confederacy was dissolved. N.'s star had sunk still lower towards the horizon. The negotiations for peace which were opened almost immediately after this failed, and the allies invaded France. In spite of a

contest full of genius, in spite of many victories, slowly but surely N. was driven back. The Austrians, Russians, and Prussians were all advancing and closing round Paris, while Wellington was gradually approaching the city from the S., having cleared the Fr. from Spain. In these circumstances N. surrendered and, after attempting useless negotiations, abdicated (1811). He retired to Elba, being given the sovereignty of that is., and the Bourbons, in the person of Louis XVIII., were restored to the throne of France.

But the long wars had left Europe in a very unsettled state, and the name N. was still one to conjure with, so that in Feb. 1815 N. again decided to try to revive his fortunes in France and Europe. He was enthusiastically received in France, and

and his coterie plotted to escape is clear, from the references to be found in the writings of his boon companion Las Cases. Amongst others, many Ains. were ready to give financial assistance; an intercepted letter spoke of £16,000 being guaranteed. The vigilance of Sir Hudson Lowe, who arrived as governor of the is. in April 1816, thwarted all attempts, and for this reason, amongst others, N.'s bitterness against him was intense. Yet the stream of falsehood and vituperation directed by N. against the governor had a deeper motive: the plan was to arouse sympathy for himself by creating the idea that he was badly treated, in the hope that the opposition in England might bring down the gov. on the question, return to power, and then release him. How much chance of success this scheme ever had is doubt-



THE RESIDENCE OF NAPOLEON AT ST. HELENA

From an old print.

The Bourbons fled. Europe declared war against him, but only Prussia and England were ready to meet him. N. determined to strike, and to strike quickly, to separate the armies and defeat them in detail. He defeated Blucher at Ligny, but Blucher had a preconcerted plan with Wellington, and while Wellington fell back on Waterloo, Blucher pushed on to come up with him as soon as possible, and Grouchy, dispatched by N. to keep Blucher back, fought only with the rear-guard of the Prussian army. Wellington held the field at Waterloo until the arrival of the Prussians, and the Fr. were swept away in headlong rout. N. fled to Paris, where for the second time he abdicated. He attempted to escape to the U.S.A., but finding this impossible, on July 15 he surrendered to Capt. Maitland of the *Bellerophon* at Rochefort. He was sent in Oct. 1815 to St. Helena, where he spent the rest of his life in exile, dying there on May 21, 1821, of cancer in the stomach.

The period of N.'s stay in St. Helena is one of great interest, for during it were laid the foundations of a Napoleonic legend, on which N. III. was to raise himself to the throne. It was, in fact, N.'s last campaign. The immediate object was a personal one, escape from the is. by one means or another. That N.

ful; however much misplaced sympathy might have been aroused, the misery and bloodshed N. had caused in his lifetime could not easily be forgotten. However, such was the scheme, and in pursuance of it the Fr. groups did their utmost to blacken Lowe's character as an inhuman jailer, admissions of this can be found in their writings. Thus it was that for many years after N.'s death, Lowe suffered much misrepresentation. Among those who fell into N.'s trap was Lord Rosebery whose book *Napoleon, the Last Phase* (1901) is a highly misleading travesty of the truth. The St. Helena campaign had another and wider object, to create a new idea of N.'s career and place in hist. Far from being the worst of autocrats, the story ran, N. had been the champion of liberty and democracy, crushed by the strength of the dictatorial monarchs of Europe; in him the revolution had found its leader and apostle, and in his downfall the cause of freedom was lost. That this fiction was ever believed is remarkable. N. himself, never believed it: to Col. Keating he summed up his views on government: 'I k. we well that nowadays it requires a rod of iron to rule men, but it must be gilded, and we must make them believe when we strike them that they direct the blow themselves. It is

necessary we should always talk of liberty, equality, justice, and disinterestedness, and never grant any liberty whatever.' In spite of the witness of his whole career, the Napoleonic legend took root and flourished. It created two nations in France; all those whom the reaction of the restoration antagonised, all who felt dissatisfied with the bourgeois monarchy of Louis Philippe, turned to the mirage of N. the liberator, and gave their support to this descendant, who was clear-sighted enough to see its tremendous value and to adopt the legend himself. Before him, it fired the young duke of Reichstadt, son of N. and Marie Louise, passing his adolescent years in the Austrian court. The exalted view of his father which he gained from N.'s memoirs fired his ambition to return to the throne of France. During his short life there were endless Bonapartist conspiracies centred around his person, and Metternich considered him, with justification, a standing menace to European peace. See F. Masson, *Napoleon invaincu*, 1892; Lord Rosebery, *Napoleon, the Last Phase* (from deportation to death), 1901; H. A. L. Fisher, *Studies in Napoleonic Statesmanship: Germany*, 1903; and *Napoleon I.*, 1924; A. Fournier, *Napoleon I.* (Eng. trans.), 1904; A. Sorel, *L'Europe et la révolution française*, 1903-4; A. Vandal, *L'Arrêté de Bonaparte*, 1912; R. B. Mowat, *Diplomacy of Napoleon*, 1924; E. Ludwig, *Napoleon* (an intimate biography, Eng. trans.), 1927; H. Butterfield, *The Peace Tactics of Napoleon, 1806-8, 1929*; and *Napoleon*, 1939; H. S. Wilkinson, *The Rise of General Bonaparte* (early military career), 1930; F. von Funck, *In the Wake of Napoleon*, 1931; J. Dechamps, *Sur la légende de Napoléon*, 1931; J. Baumville, *Napoleon* (Eng. trans.), 1932; H. Bellac, *Napoleon*, 1932, and *The Campaign of 1812*, 1934; B. H. Liddell Hart, *The Ghost of Napoleon* (strategy), 1933; J. Holland Rose, *Napoleon I.*, 1934; L. Currie, *The Baton in the Knapsack* (sketch), 1934; P. Guedalla, *The Hundred Days*, 1934; F. M. Kircheisen, *Napoleon*, 1925-34; A. G. Macdonell, *Napoleon and his Marshals*, 1934; L. Villat, *La Révolution et l'Empire*, 1936; E. Tarle, *Bonaparte* (Eng. trans.), 1937; R. Brice, *The Riddle of Napoleon*, 1937; O. Aubry, *St. Helme*, 1935 (Eng. trans., 1937); L. Madelin, *Consulat et Empire*, 1937-38; Dorner Creston, *In Search of Two Characters*, 1945, 1947; H. Cottard, *Structure du génie de Napoléon Jr.*, 1946; S. de Chair (ed.), *Napoleonic Memoirs*, 1948; and P. Geyl, *Napoleon: For and Against*, 1949.

Napoleon II. (1811-32), son of N. I. by his marriage with Maria Louise of Austria, b. at Schönbrunn, Vienna. After his father's downfall at Waterloo, he was proclaimed N. II., king of Italy. He was educated in Vienna and served in the Austrian Army. He was created duke of Reichstadt (or Bohemia) in 1817 and king of Rome by his father. But his health was poor, and physical weakness and illness led to his early death. See F. Masson, *Napoléon et son fils*, 1922, and Dorner Creston, *In Search of Two Characters*, 1945, 1947.

Napoleon III. (Charles Louis Napoleon Bonaparte) (1808-73) the third son of Louis Bonaparte, who was created by his brother king of Holland. His mother was Hortense Beauharnais, the step-daughter of the Emperor N. He was brought up principally at the castle of Arenenberg, his mother's residence in Switzerland, and was given a very sound education. He was something of a scientist and an engineer, and he also studied a good deal of hist. In 1831 he took part in one of the liberation campaigns in Italy, together with his elder brother Louis, who, however, d. of fever during the campaign. In 1832, by the death of the first N.'s only son, the duke of Reichstadt, he became the head of the family, both his elder brothers being dead. During the next few years he pub. a good deal of literature, dealing principally with his political ideas. During the reign of Louis Philippe, taking advantage of the disturbed state of France, he made two attempts to establish himself in that country. The first, in 1836, was easily repressed, and he was deported to America; the second, in 1840, when he landed at Boulogne, ended in his being condemned to lifelong imprisonment in the fortress of Ham. There he continued his writings, and added to his already large output of Bonapartist literature. After just over five years' imprisonment he managed to make his escape, and returned to London. Taking advantage of the revolution of 1848, he hurried back to France, where he had been elected as a deputy on the Constituent Assembly. Having taken his seat, he almost immediately resigned, but was again elected for five different constituencies. Encouraged by this, he determined to stand as a candidate for the presidency, and was elected by a majority of five to one over his opponent, Gen. Cavaignac. At first there seemed to be some possibility of concord in France, but the president, although he had taken the oath of allegiance to the republic, soon showed his hand. He rapidly assumed the control of the army, practically every post of importance was held by his own nominees, and finally, in Dec. 1851, he dissolved the Assembly by force and brought about his famous but violently bloody *coup d'état*. France for the time seemed to acquiesce. He was in the same month proposed as candidate for ten years as president and elected to the position by a majority of 7,000,000.

He now made no pretence at disguising his reactionary measures. Posing as the candidate and representative of the people, he rapidly developed into a despot, who gagged the press and did his best to repress liberty. In 1853 he married the Countess Eugénie de Montijo. He still continued to pose as the friend of democracy, but his interference in It. affairs led to the annexation of Nice and Savoy to France, whilst his attempt to impose a monarch on the Mexicans led to one of the most pathetic tragedies that the world has witnessed. His foreign policy at times appears brilliant, and he was often in close alliance with Great Britain, e.g.

during the Crimean war. But he realised, probably in a greater degree towards the end of his reign, the necessity for turning the minds of Frenchmen towards foreign conquest. By 1865 it became apparent that his influence was on the wane. The book which he had written for the purpose of extolling his own methods of gov. did not meet with complete success, and he realised that a more liberal policy was necessary. This he tried to adopt, but too late. In 1870, becoming aware that his main support, the army, was beginning to fall away in its allegiance, he made a last attempt to rally it. He interfered in the question of the Sp. succession, for which prince of the house of Hohenzollern was a candidate, and although the Prussians withdrew their prince, events led on to declaration of war. N. was unaware of the state of his army. When he declared war he was firmly convinced that the Fr. would easily gain Berlin, but 300,000 Frenchmen were opposed by 500,000 Prussians, and N. never crossed the Rhine. He was crushed at Saarbrücken, at Weissenburg, and at Metz, and finally came the crowning defeat at Sedan. On Sept. 2, the day after the battle, N. surrendered to the Prussian king, and was kept a prisoner until the end of the war. In the meantime his empress had retired to Chislehurst in Kent, where in 1871 she was joined by N., who d. here nearly two years later. He wrote *Rêveries politiques* (1832), *Idées napoléoniennes* (1839), *De l'extinction du paupérisme* (1844), *Événements militaires* (1856) and *Histoire de Jules César* (1865-1866). See P. de la Gorce, *Histoire du second Empire*, 1894-1901; K. Marx, *The 18th Brumaire of Louis Bonaparte* (Eng. trans.), 1908; H. A. L. Fisher, *Bonapartism*, 1908; F. A. Simpson, *The Rise of Louis Napoleon*, 1909, and *Louis Napoleon and the Recovery of France*, 1923; and O. Aubry, *Le Second Empire* (with bibliography), 1938. See also d'Hauterive, *Correspondance intime de Napoléon III, et du prince Napoléon*, 1925, and Mrs. Bellac Lowndes, *She dwelt in Beauty*, 1919.

Napoleon, Eugène Louis (1856-79), only son of N. III. *See BONAPARTE.*

Napoleon, Prince Lucien (1775-1840), *see BONAPARTE.*

Napoleon, obsolete Fr. gold coin of the value of twenty francs (nominally 15s. 10d. Eng. money), with a portrait of Napoleon stamped on it.

Napoleon, or more commonly 'Nap,' a card game. Probably the element of chance easily predominates over the skill required, for which reason the game may well be included under the category of gambling contests. The ordinary form of the game consists in dealing five cards to each of a number of players (as many as ten can play), the object being to make as many tricks as possible, each playing against each, or only combining for the sake of defeating the player who has obtained the lead, and therefore named the trumps to suit his own hand by making the highest call. Tricks are made by putting down the highest card in each

round, it being imperative to follow suit if possible; if not the player may, if he can, trump the led suit. There is nothing very complicated in the game. Betting is usually level-money all round, at some agreed sum per trick, very often a penny or halfpenny--hence the term 'penny nap.' Generally, if a player wins after 'going nap,' i.e. calling all five tricks, the other players pay him ten counters or pennies, or other unit adopted, i.e. double stakes. If he loses, however, he forfeits only five, probably as a consolation for a bold risk. There are variations of the game, one of the most popular being 'Misery.' Here there may or may not be trumps according to arrangements among the players, but as a rule there are no trumps. The *misere* hand is that held by the player who undertakes to *lose* all five tricks, the remaining players of course endeavouring to force tricks upon him.

Napoleona Imperialis, *see BELVIA.*

Napoléon-Vendée, *see LA ROCHE-SUR-YON.*

Napoléonville, *see PONTIVY.*

Napoli, *see NAPLES.*

Napoli di Romania, *see NAUPLIA.*

Napo Pastaza, prov. of Ecuador, combined with Santiago Zamora to form the Región Oriental, with an area of 219,093 sq. m. and a pop. of 295,200. The cap. of N. P. is Tena. Balsa wood is produced.

Nara, tn. of Hondo, Japan, 254 m. from Osaka by rail. It has anct. temples and sev. shrines and relics of great age. Toys and fairs are manufactured. Pop. 57,500.

Naracoorte, business centre of rich pastoral and dairy-ing dist. Situated 239 m. S.E. of Adelaide, S. Australia. Railway junction on Adelaide-Mt. Gambier and N.- Kingston lines. N. caves, 7 m. from the tn., are a well-known tourist attraction, consisting of a group of deep limestone caverns with stalactite and stalagmite formations. N. has a large hospital. Pop. 2194.

Narasinha, in Hindu mythology the fourth *avatār* of Vishnu, the reincarnation of the god in the form of man in order to put to death Hiranya-Kacipan, king of the Daityas, who was oppressing mankind.

Narayanpet, tn. in the state of Hyderabad, India, 70 m. S.W. of the city of Hyderabad.

Narbada, or **Nerbudda**, riv. of India, rising in the Central Provs., flowing in a generally W.S.W. direction till it falls into the gulf of Cambay, 28 m. W. of Broach. Length 750 m. Area of basin 39,260 sq. m. Navigation is impeded by rocks and shallows.

Narbonne, city in the dept. of Aude, France, 37 m. E. of Carcassonne. It is connected with the Mediterranean at La Nouvelle, 13 m. distant, by the canal du Midi. It had a notable cathedral, now the church of St. Just, begun in 1272, and connected by a ruined cloister with the archiepiscopal palace, now used as a museum of art and archaeology. It has a large trade in red wine and spirits, and a celebrated white heather honey. There are distilleries, tanneries, potteries, and manuf. of verdigris, bricks, and tiles.

Pop. 29,900. *See R. Rey, L'Art gothique du Midi de la France, 1934.*

Narbrough, or Narborough, Sir John (1640-88), Eng. admiral, b. in Norfolk. In 1670 he conducted an expedition through the straits of Magellan. In 1674 he commanded another expedition to the Mediterranean, and was successful in destroying sev. Algerian and Tripolitan pirate ships. His last expedition was that to the W. Indies in 1687, and while superintending the recovery of a treasure ship (off St. Domingo) he was attacked by fever and d.

Narcetia, or Narcine ($C_{23}H_{27}O_8N$), somniferous poison prepared from opium bases. It is the most powerful narcotic of all the opium alkaloids. Practically insoluble in cold water, soluble in alcohol and hot water, insoluble in ether. Yields narcic acid on oxidation with potassium permanganate. It is decomposed by the stronger and concentrated acids. It is formed from narcotine (q.v.) by treating the methiodide with aqueous caustic soda.

Narcissus, youth in Gk. mythology famous for his beauty. He was beloved by many, including the nymph Echo (q.v.), but rejecting all their advances, was punished by the gods, who caused him to pine away for love of his own image, which he saw reflected in a pool. He was changed into the flower which bears his name, whence the term narcissism, by which psycho-analysts mean excessive love and admiration of oneself.

Narcissus, genus of hardy bulbous plants (family Amaryllidaceae), and including some of the most beautiful garden flowers. The six perianth segments are surmounted by the conspicuous corona; there are six stamens of three fused carpels, with an inferior ovary. The different varieties of the species are so numerous that they have been classified into three sections or groups: (1) Magni-coronati (trumpet daffodils); (2) Medio-coronati (star N.); (3) Purvi-coronati (poet's N.). The first group is typified by *N. Pseudonarcissus*, the common daffodil or Lent lily, the only Brit. representative of the genus. In this section, the corona is funnel-shaped or cylindrical, as long as, or longer than, the perianth segments. It includes *N. bulbocodium*, the hoop petticoat daffodil. The second section has the corona cup-shaped, about half as long as the perianth segments. In this are included *N. incomparabilis*, the chalice-cup daffodil; *N. triandrus*, angel's tears; and *N. juncifolius*, the rush-leaved daffodil. The third section has the corona small or saucer-shaped, and includes *N. poeticus*, the poet's, or pheasant's-eye, N.; *N. Tazetta*, the polyanthus N.; and *N. Jonquilla*, the jonquil. Speaking generally, the cultivation of Ns. is simple. The bulbs do best in a good loamy soil free from fresh animal manure, and the earlier they are planted the better. A general rule in planting is to set the bulbs about one and a half times their length deep in the soil. The flower should be removed after they have faded.

Many Ns. bear forcing well, and bloom can be had from Nov. N. bulbs should not be lifted till the leaves are quite yellow.

Narcissus Fly, or *Merodon equestris*, dipterous fly, giving rise to larvae which do very serious damage to N. bulbs. It appears between May and July, and lays its eggs between the leaves and on the ground. The fly is somewhat like a bee, about $\frac{1}{2}$ in. long and with variable stripes of red, yellow, or white, and with a black band across the thorax, but is distinguished by its two-winged character and the absence of the long black antennae found in all bees. The flies are best caught with a net when they settle for egg-laying, or can be trapped with saucers of treacle or honey. Newly bought bulbs should be carefully examined so that all infested bulbs can be lifted and destroyed. The occurrence of the pest must be notified to the Ministry of Agriculture.

Narcotic Poisons, see under Poisons.

Narcotics, drugs which produce stupor if the dose is increased beyond a certain limit. The most important N. is opium. The opium alkaloids, alcohol, belladonna, henbane, Indian hemp, and chloral all have a primary stimulating effect, but are poisonous in excess. Owing to their power of inducing sleep, some are called hypnotics or soporifics (e.g., sulphonal), while others which alleviate pain are called analgesics (e.g., antipyrin).

Narcotine ($C_{23}H_{29}O_7N$), alkaloid occurring in opium. It was discovered in 1817 by Robiquet, and thought to be the stimulating principle of opium, but it has less narcotic power than morphine. It is nearly insoluble in water, sparingly soluble in alcohol, and readily soluble in chloroform and ether. It has slightly alkaline properties, is a derivative of benzyl isoquinoline, and has a large number of decomposition products, of which vanillin is well known as the flavouring principle of vanilla. Its salts are not readily crystallisable, are more bitter than morphine, and its sulphate is used instead of quinine in India; its chief use is as a source of the medicinal substance coturnine.

Narcylene, see under ACETYLENE.

Nard, and Nardostachys, see SPIRENARDO.
Nardi, Jacopo (1476-1563), It. historian, b. at Florence. In 1527 he was sent as an ambas. to Venice. His work entitled *Storia della Città di Firenze dell' anno 1494-1531*, pub. in 1582 (and a second ed. in 1581), forms a sequel to that of Machiavelli.

Nardo, tn. of Italy, prov. of Lecce, 24 m. W. of Otranto. It has a fifteenth-century cathedral and textiles are manufactured. Pop. 21,500.

Narenta, see NISETVA.

Nares, Sir George Strong (1831-1915). Scottish admiral and explorer, b. in Aberdeen. In 1852 he was a member of Sir Edward Belcher's expedition in search of Sir John Franklin. In 1867 he was captain of H.M.S. *Challenger*, the first steamship to cross the Antarctic Circle. From dredging operations, it was inferred

that there was a continent in the far S. In 1875 Nares led an expedition to reach the N. pole, reaching Grant Land, 81° 44' N. lat. Sir Albert Markham in the *Aert*, one of the boats of this expedition, reached 83° 2' N. Nares did valuable hydrographical work on Mediterranean currents and on the equatorial current, and received the founder's medal of the Royal Geographical Society, 1877, and the gold medal of the Geographical Society, Paris, 1874. He pub. sev. works on his explorations.

Nares, James (1715-83). Eng. composer, b. at Stanwell, Middlesex. He studied music under Dr. Pepusch, eventually becoming organist of York Cathedral. In 1756 he became organist and composer to the king, and at about the same time received his degree as Mus.Doc. at Cambridge. In the following year he was appointed master of the choristers of the Chapel Royal. His compositions, mostly church music, include a number of anthems.

Narew (Narew), Battles of the, fought in 1915, the riv. forming the line of the Russian defence of Warsaw against Hindenburg's advance. The fighting extended over the period June-Aug., Warsaw falling in Aug. 1915. See further under *World War, First*.

Narino, dept. of Colombia, in the S.W. corner of the country, with the Pacific Ocean to the W. and Ecuador to the S. Stock raising is important, gold is mined, and cereals, cacao, rice, potatoes, and sugar are grown. There are manufs. of footwear and Panama hats. There is a univ. at Pasto, the cap. Area, 11,515 sq. m. Pop. 537,400.

Narni, tn. and episcopal see, in the prov. of Perugia, Italy, 65 m. N. of Rome. It has a thirteenth-century cathedral, and was a bishop's see for 1,500 years. There are mineral springs near, and many Rom. remains. The medieval bridge, adjacent to the Ponte Augusto, was blown up by the Gers. in the Second World War. Pop. 14,000.

Narocz, Battle of Lake. Lake Narocz is in Lithuania, situated about 60-70 m. N.E. of Vilna. In the autumn of 1915 the Gers. and Austrians forced back the Russians along the whole of the E. front, and in the region of the lake the line ran practically due N. and S. To relieve the pressure of the Gers. on the W. front, who were then making some progress at Verdun (q.v.), it was arranged to create a diversion on the E. front, and an advance in this region was designed. All available Russian resources were duly concentrated and the battle opened at dawn on March 18. Once the Gers. had recovered from their surprise they resisted every Russian advance. The battle dragged on for sev. days and eventually petered out about March 27, owing to the exhaustion of the Russians.

Narragansett Bay, inlet on the S.E. of Rhode Is., U.S.A. It is nearly 28 m. long and 3 to 12 m. wide. It encloses a number of is., the largest of which is Rhode Is. See *Rhode Island*.

Narragansett Indians, nearly extinct

tribe of Algonquin stock, who formerly roamed about Rhode Is. and the W. shores of N. Bay. Their friendliness towards the original settlers of Rhode Is. later changed to hostility, and they were defeated by the Eng. governor, Winslow, in 1675.

Narragansett Pier, summer resort, 9 m. W. of Newport, Rhode Is., U.S.A.

Narrows, The, very short strait, 8 m. S. of New York, between Long Is. on the E. and Staten Is. on the W. It forms one of the prin. entrances to New York harbour.

Narses (A.D. c. 472-568), celebrated general and statesman of the Byzantine Empire. He was an Armenian by birth. In 538 he was sent to Italy to act in council with Belisarius against the Goths. He quarrelled with the general and was recalled in 539, but on the recall of Belisarius in 552, N. was appointed to command in Italy, and at a fierce engagement at Tagina defeated the Goths, and killed their king, Totila. In 553 he defeated Teja near Sorrento and took Rome. He was made exarch of Italy, fixed his court at Ravenna, and, until the death of Justinian in 565, administered the affairs of Italy with ability and vigour. At the accession of Justin he was accused of extortion and dismissed. After this he was accused of intriguing with Alboin, king of the Lombards, for a new invasion of Italy, but his participation was never proved, as he d. at Rome in 568 before the Lombard invasion. See E. Gibbon, *Decline and Fall* (ed. 1896-1900). See also *Goths; Justinianus*.

Narsinghpur: 1. Cap. of a dist. of the same name, in Orissa Prov., India, 50 m. W.S.W. of Jajalpur. It is the seat of the cotton and grain trade of the Narbada valley. Pop. 12,000. 2. The dist., formerly a state, but now merged into Orissa Prov., occupies the upper part of the Narbada valley, where extensive grain crops are raised. Coal is mined in the dist. (at Mohpani), and there are manufs. of brass work, iron ware, cotton, and silk. The Great Indian Peninsula Railway traverses the dist., which has an area of 204 sq. m. and a pop. of 18,000.

Narthex, colonnade outside the W. doors of basilican and certain other churches. In early times it formed part of the atrium, but on the disappearance of this feature it frequently remained. It was the place for the penitents who were not allowed to enter the church itself.

Narva, or Ivangorod, seaport in the Estoman S.S.R. on the R. Narova, 90 m. W.S.W. of Leningrad. It was founded in 1256. Its fortress, Ivangorod, was abandoned in 1864. There is a cathedral and an old tn. hall (1683). The falls of the riv. afford water-power for driving Pop. 27,000.

Narvaez, Pánfilo de (c. 1480-1528). Sp. soldier, b. at Valladolid. He went to America, and fr. c. 1512 was under Velasquez in command of an auxiliary force in the conquest of Cuba. In 1520 he was sent to supersede and punish Cortés, but was defeated at Cempoala and deserted

by his army. Having returned to Spain he was appointed governor of Florida in 1526, but was drowned in 1528.

Narvaez, Ramón María, Duke of Valencia (1800-68), Sp. general and statesman, b. at Loja, Granada. N. entered the army in 1815, supported the Constitutional party, 1822-23, served against the Carlists, 1834, completely defeated Gómez at Majacete, Nov. 1836, opposed Espartero, and was obliged to flee to France about 1839, where he was afterwards joined by Queen Christina. He started a revolution in her favour and entered Madrid, 1843; the same year he declared the majority of Isabella II, and became lieutenant-general of Spain. He was created duke and Prime Minister, 1844-1846; ambas. at Paris, 1847; head of the ministry, 1847-51, 1856-57, and 1864-65. With O'Donnell he suppressed a great military revolt at Madrid, 1866; and was minister, with Bravo Murillo, 1866.

Narvik, or Victoriahavn, seaport of Norway, on the Ofoten Fjord. It owes its rise to the construction of the Ofoten railway, completed 1903, and is the port for the shipping of iron ore. On April 13, 1940, a Brit. flotilla forced its way into N. fjord and sank four Ger. destroyers. Early in May a combined Anglo-Fr. force under Lt.-Gen Auchinleck (q.r.) made a strong attack on the Ger. garrison at N., which was captured on May 28; but on June 10 the Brit. forces left. Pop. 4500. See further under NAVAL OPERATIONS IN SECOND WORLD WAR: NORWAY AND DENMARK, GERMAN INVASION OF (1940).

Narwhal, or Sea Unicorn (*Monodon monoceros*), cetacean, allied to the dolphins and porpoises. The male has one, almost invariably the left, of the teeth or tusk in the upper jaw extraordinarily developed into a spirally furrowed horn of pure ivory from 6 to 10 ft. long. This is the longest tooth found in the Mammalia. The adult animal is from 10 to 16 ft. long. It has a grey back, mottled with black, the under parts being much lighter, but also spotted. It has a blunt short head, no dorsal fin and very small flippers, but is very active and a rapid swimmer. It is peculiar to the Arctic Ocean, though it occasionally strays as far S. as Brit. seas. The oil is valuable and the flesh edible.

Nascent State. Gases in the free state usually consists of molecules containing two or more atoms. These atoms are held together by a force of attraction which, it is natural to suppose, must be overcome before chemical action can be effected. So it would be supposed that gases, which have just been liberated from combination and before the atoms have had time to combine into molecules, would be more chemically active than after combination into molecules. This is found to be so, and chemists use the term 'nascent state' to define the condition of substances which so act at the instant of their liberation from combination. Ordinary nitrogen will not unite with hydrogen, but if a solution of a compound of nitrogen be poured into a flask in which hydrogen is being generated, then ammonia will be formed. The peculiar behaviour of

'nascent' gases varies according to the reactions in which they are formed, and thus is not solely due to their being in the atomic state.

Nascimento, Francisco Manoel do (1734-1819), Portuguese poet and miscellaneous writer, wrote under the Arcadian pseudonym 'Filinto Elysio,' though so far from ever having been a member of the so-called Arcadians N. founded a school of rivals, named Filintists. His graceful lyrics and prose enriched the language, resisted foreign intrusions, and preserved national traditions. His influence in thereby reviving letters in his country was considerable, yet not so great as that of the less original Manoel de Bocege. Among his works are romantic *contos* or scenes of Portuguese life. He is also remembered for his patriotic odes, notably *To Neptune speaking to the Portuguese and To the Liberty and Independence of the United States*.

Naseby, par. and vil. of Northamptonshire, England, 7 m. S.S.W. of Market Harborough. Near here was fought the famous battle which practically decided the issue of the Civil war on June 14, 1645. Prince Rupert commanded the right wing of the Royalist cavalry and, as usual, routed the forces opposed to him, who were led by Ireton. The king, in charge of the centre, was on the point of overpowering Fairfax, who was in command of the new model army of 14,000 foot and 7000 horse, when Cromwell, having put to flight the left wing of the Royalist army, hastened to the assistance of his chief. This movement decided the battle, especially as Rupert had lost his advantage by pursuing the fugitives too far. The Royalists were totally routed, the king's baggage taken, and his letters to the queen and to the Irish rebels, which showed that while negotiating with the Parliament he had no intention of coming to terms, were pub.

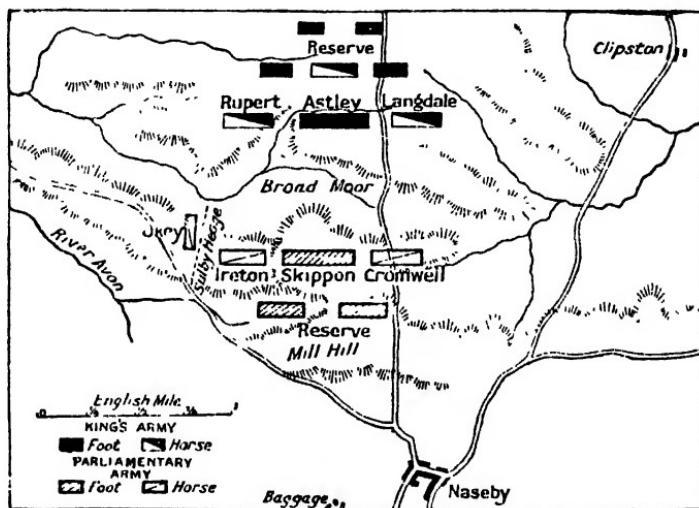
Nash, John (1752-1835), Brit. architect, b. at Cardigan in Wales. He is chiefly famous for his street improvements in London. He planned Regent Street between Carlton House and Regent's Park; repaired and enlarged Buckingham House, from which his entrance gateway, known as the Marble Arch, was removed to Cumberland Gate, Hyde Park; laid out Regent's Park, and designed the terraces along the edge of the park. The Brighton Pavilion is also a specimen of his work. See J. Summerson, *John Nash, Architect to King George IV* (1935).

Nash, John Northeote (b. 1893), Eng. artist, second son of W. H. Nash. He was educated at Wellington College, and joined the Artists' Rifles in 1916. He served in France 1916-18, and was commissioned to paint war pictures for Imperial War Museum. It is as an illustrator and wood-engraver that he is chiefly known. See his *Poisonous Plants*, engraved in wood (1927), and his illustrated eds. of Swift's *Directions to Servants* (1925); Ovid's *Elegies* (1925); Spenser's *Shepheardes Calendar* (1930); and others. See also *John Nash* in Brit. Artists of To-day series, 1925.

Nash, Paul (1889-1946), Eng. painter, known especially for landscapes and water-colours; b. in London. He was educated at St. Paul's School and the Slade School. In 1917 he was one of the official artists on the W. front. His work was exhibited at the Leicester Galleries in 1918 and in 1924. A painter of the Post-Impressionist school, his style represents the flat definition in the Eng. Post-Impressionist movement. Though taught at the Slade School he had little in common with the orthodoxy of that institution. It was in 1911-12 that his water-colours began to attract attention at the New Eng. Art Club. His war pictures, poignant ex-

and was admired for his manners and taste, his sobriquet of 'Beau Nash' being an allusion to his foppery, his name having become proverbial in that connection. He was also mainly instrumental with Ralph Allen and Dr. Oliver, in establishing the mineral water hospital at Bath. See life by Goldsmith, 1762, and L. Melville, *Bath under Beau Nash*, 1908.

Nash, or Nashe, Thomas (1567-1601), Eng. satirist, critic, and playwright, b. at Lowestoft. His first pub. was an acrid review of recent literature prefixed to Greene's *McQuaphon*, which he discussed at greater length in *The Anatomic of Absurditie* (1589). After this he was engaged in



THE BATTLE OF NASEBY, JUNE 14, 1645

pression in art of the emotions of broken soldiers won instant popularity. One of the most striking is his 'Inverness Copse.' He was official war artist to Air Ministry, 1940; to Ministry of Information, 1941. Pubs.: *Places, Prose Poems and Wood Engravings* (1922), and monographs in Contemporary Brit. Artists series 1923, 1927. His autobiography *Outline* was pub. in 1949. See Margaret Eates, *Paul Nash Memorial Volume*.

Nash, Richard, or 'Beau Nash' (1674-1762), Brit. dandy, b. at Swansea and educated at Carmarthen, whence he was sent to Jesus College, Oxford, where he remained only a short time. Later he was given an ensign's commission, but soon left the army and then entered the Middle Temple, but never took up the law as a profession. A zest for pleasure and gaming drew him, in 1705, to Bath and thenceforth he made his living by gambling, and was noted for his extravagance. At Bath he estab. the first assembly room, became the recognised autocrat of the tn.,

the Marprelate controversy for a time, and in 1792 pub. *Pierce Pennilesse, his Suplication to the Devil* as a reply to the savage denunciations of Richard Harvey. These were followed by *Strange News* (1592); *Christ's Tears over Jerusalem* (1593), like Greene's pamphlets, a picture of loose life in London, with the same kind of dubious contrition and denunciation of immorality; *The Terror of the Night* (1591), the theme of which is ghosts and superstitions, notable for the praise of Daniel's 'Della'; and *The Unfortunate Traveller, or the Life of Jack Wilton* (1594), the best novel of adventure in England before Defoe's. Besides these he pub. *Hare with you to Saffron Walden* (1596), an onslaught on Gabriel Harvey; *The Isle of Dogs* (1597), a comedy in which he attacked the current abuses in the state, and for which he suffered imprisonment in the Fleet; *Lenten Stuffe* (1599), an amusing description of Yarmouth; and *Summer's Last Will and Testament*, a comedy (1600). *Nashua*, co. seat of Hillsboro co., New

Hampshire, U.S.A., on the Merrimac R., 14½ m. from Manchester. There are manufs. of sheetings, paper products, asbestos, refrigerators, etc. N. is situated in a farming dist. producing fruit, hay, potatoes, and stock. Pop. 33,000.

Nashville, cap. of Tennessee, and co-seat of Davidson co., U.S.A., on the Cumberland R., 185 m. S.S.W. of Louisville. It is a great railway and commercial centre, with extensive trade in cotton and tobacco, and manufs. of cotton, silk rayon, hardwood flooring, fertiliser, flour, oil, paper, woollen goods, leather, etc. Printing and publishing are important industries, and it has a large lumber market. It is also the seat of many educational institutions, including Vanderbilt Univ., N. Univ., Fisk Univ., and Walden Univ. for Negroes (founded as Central Tennessee College). Here in 1864 the Federals defeated the Confederates (see NASHVILLE, BATTLE OF). N. was founded in 1780, incorporated as a tn. in 1784, chartered as a city in 1806, and made the cap. of the state in 1843. Pop. 167,400.

Nashville, Battle of, in the Amer. Civil war a victory for the Federal forces under Gen. Thomas against the Confederates under Gen. Hood. In Nov. 1864 Thomas was garrisoned in the tn. of N., Tennessee, which had been surrendered to the Federals in Feb. 1862, and with his army of 50,000 men he faced the advance of Hood's superior force. A preliminary engagement took place at Franklin, where Gen. Schofield succeeded in retarding Hood's advance. On Dec. 15, 1864, Thomas advanced and succeeded in outflanking Hood on the left. This movement he followed up by a general attack which turned Hood's defeat into a rout. Hood's army was depleted of half its numbers and driven back across the R. Tennessee. The pursuit continued for thirteen days as far as Lexington, Alabama, although impeded by floods. The B. of N. was one of the most decisive in the course of the Civil war. See W. B. Wood and J. E. Edmonds, *Civil War in the United States*, 1937.

Näsijarvi, long narrow lake of S.E. Finland, N. of Tampero (Tammerfors). It has an area of 101 sq. m., and in parts reaches a depth of over 300 ft.

Nasik, tn. and dist. in Bonbay Prov., India. The tn., situated on the Godavari R., is famous as a place of Hindu pilgrimage. In the vicinity are some ant. Buddhist caves. There are manufs. of cotton goods, brassware and copperware, and mineral waters. The dist. has an area of 5922 sq. m. Pop. (tn.) 42,756; (dist.) 1,113,900.

Nasirabad: 1. Or Nusseerabad, tn. of E. Bengal, Pakistan, in the Mymensingh dist., 73 m. N. of Dacca. The earthquake in 1897 destroyed the church and high school. Pop. 15,000. 2. Tn. of Bombay Prov., India, in the dist. of E. Khandesh, 120 m. S.W. of Indore, noted for the manuf. of glass bangles. Pop. 14,390. 3. Tn. and cantonment in Ajmer-Merwara, India. Pop. 25,000. 4. Tract of country now in Pakistan, acquired by the Brit.

from the khan of Kelat in 1903 on payment of an ann. sum of about £7300.

Nasir-ed-Deen (*Nasir Uddin*), Mohammed Ibn Hassan (c. 1200 c. 1276), Persian astronomer, b. at Toos in Khorassan and appointed superintendent of an observatory at Azerbaijan. He wrote the *Hechic Tables*, somewhat resembling those of Ptolemy.

Nasmith, David (1799-1839), originator of tn. and city missions, b. at Glasgow. In 1813 he became secretary to the Glasgow Youths' Bible Association and devoted himself to religious work, and in 1821-28 was assistant-secretary to no fewer than twenty-three charitable societies. He founded the Glasgow City Mission in 1826, the Local Missionary Society for Ireland, the London City Mission, and the Brit. and Foreign Mission, besides about thirty-two in the U.S.A. and Canada.

Nasmyth, Alexander (1758-1840), Scottish portrait and landscape painter, b. in Edinburgh. He was a pupil of Allan Ramsay. In 1778 he estab. himself in Edinburgh as a portrait painter, and had Robert Burns among his sitters. Ultimately he confined himself to landscape painting, although much of his time was occupied in teaching, and in 1822 he pub. sixteen views of places described in the Waverley novels. He was a member of the original Society of Scottish Artists, and an associate of the Royal Institution. See J. Nasmyth, *Autobiography*, 1883.

Nasmyth, James (1808-90), Brit. engineer, the son of Alexander N., and brother of Patrick. In 1834 he started business for himself at Manchester, subsequently establishing the Bridgewater foundry at Patricroft, where he invented the steam hammer. It was afterwards adopted by the Admiralty, N. having taken out a patent in 1842. He also invented a nut-shaping machine, a flexible shaft for driving small drills, and hydraulic punching-machine; he was the first to observe, in 1860, a mottled appearance of the sun's surface called 'willow leaves' or 'rice grains.' He pub. *Remarks on Tools and Machinery* (1858) and *The Moon considered as a Planet, a World, and a Satellite*, in conjunction with James Carpenter (1874). See his *Autobiography* (ed. S. Smiles), 1883.

Nasmyth, Peter, commonly known as Patrick (1787-1831), Brit. landscape painter, b. in Edinburgh. His landscapes won for him the name of 'the Eng. Hobbeina.' The reputation of his works has greatly increased since his death; indeed, one was sold at Christie's for 1300 guineas in 1892. Some of his paintings are 'Haslemere,' 'Turner's Hill, East Grinstead,' 'Cottage in Hyde Park,' 'A Country Road,' 'A Cascade,' 'Sir Philip Sydney's Oak, Penshurst,' and 'View of St. Albans.'

Naso, see OVID.

Nasr-ed-Din (1829-96), shah of Persia. Through the influence of his mother, a princess of the Kajar family, he became governor of Azerbaijan and heir apparent in place of his elder brothers. His succession to the throne was strongly opposed,

particularly by the Babis (reformers), but he wreaked savage vengeance on them. He signed a treaty of friendship with Russia and so remained neutral during the Crimean war. In 1856 he seized Herat but was driven out by Sir James Outram, a treaty being signed in Paris (March 1857). For the rest of his long reign he treated Great Britain and Russia with equal friendship. He is famous as the first shah to visit Europe, which he did with a sumptuous retinue. One result of his contact with Western civilisation was a proclamation of religious toleration (for his other innovations see under *Persia, History*). His one fatal mistake was the grant of a tobacco monopoly to a private company. This he was soon compelled to abrogate owing to the objections of his subjects. This unpopular sale of the tobacco monopoly was probably a factor in his assassination, which occurred at Tehran on May 1 at the hands of a member of El Bab's faction. Abstentious in habits, he was devoted to music and poetry. He was succeeded by his son, Muzaffar-ed-Din (Muzaffarn'ddin).

Nassarawa: 1. prov. of N. Nigeria, situated on the N. bank of the R. Benue, with an area of 18,000 sq. m. Cotton is extensively grown, other products being rubber, palm kernel, and beni seed. Pop. over 170,000. 2. Tn., cap. of the prov., 90 m. N.E. of Lokoja. Pop. over 12,000.

Nassau: 1. Independent duchy up to 1866, in which year it was incorporated with Prussia and until 1916 part of the prov. of Hesse-N. (see *Hesse*). Its former area was 1830 sq. m. and at the time of its incorporation it had a pop. of 466,300, and an area of 1815 sq. m. The Taunus Mts. rise in the S. to an elevation of 2750 ft. The Rhine, Main, and the Lahm are the chief rvs. of the region, but there are also numerous small streams. The hills are well wooded, abounding in game, and the dist. is rich in minerals. There are numerous mineral springs, and the soil is very productive. In N. are the noted Erns and Wiesbaden spas. It was united to Orange-N. by Napoleon I. in 1806, who presented the dukedom to Frederick William. Pop. 2,200,000. 2. Formerly New Providence, is situated in the E. end of the is. of New Providence. It is the cap. of the Bahamas, and has trade in pearls, fruit, of which tomatoes are important, salts, and sponges. Pop. 12,900.

Nassau or Pagl Islands, two is., belonging to the Mentawai chain, off the W. coast of Sumatra. They are of volcanic origin, and have an irregular surface, which is densely wooded. The chief products are coconuts, sago, trepang, and timber.

Nasturtium, name wrongly but persistently given to the two garden species of *Tropaeolum*, *majus* and *minus* (q.v.). The true N. is the common watercress (*N. officinale*) (q.v.).

Nastved, tn. of Zealand, Denmark, about 14 m. N.W. of Præsto. Kähler's works there are noted for their refined glazed earthenware. Pop. 9000.

Natal, original prov. of the Union of S.

Africa, lies in the S.E. portion of the continent, and is bounded on the E. by the Indian Ocean. The prov. has an estimated area of 35,284 sq. m. Zululand (10,425 sq. m.) was annexed to Natal in 1897, and the N. dists. of Vryheid, Utrecht, and part of Wakkerstroom, which formerly formed part of the Transvaal, were added to Natal ter. in 1903. The seaboard of Natal is about 376 m. in length, and has only one bay of importance, that of Durban. The country rises inland in a succession of terraces from the low and sandy coast, culminating in the heights of the Drakensberg, whose highest peak is Mont aux Sources (over 11,000 ft.). Majuba Mt. (7000 ft.) lies S.W. of the pass of Laing's Nek, which leads into Transvaal ter. The country is watered by the Tugela, Buffalo, Klip, Mooi, and other rvs., which are useful for irrigation purposes, although useless for navigation. There are no fewer than thirty-five distinct rvs. running into the Indian Ocean. The climate is subtropical on the coast but somewhat colder inland. The cooler or winter half of the year is considered as beginning in April and ending in Sept., the average number of rainy days being thirteen. Malaria in mild form is present on the coast lands of old Natal, becoming more severe in Zululand and as one proceeds northwards along the coast. The rainfall at Durban is about 39½ in., and at Pietermaritzburg about 30 in., the greater part of which falls during the summer months, May, June, and July being comparatively dry. The prevailing wind is S.E. in the summer months, as at the Cape of Good Hope. Occasionally the sirocco, or hot wind, from the N.W. is felt. Heat which might otherwise be oppressive is generally tempered by the sudden thunderstorms so frequent in Natal during the hot months. The leading crops for export are sugar, tea, maize, and wattie bark; other crops include lucerne, sweet potatoes, peas, pumpkins, and vegetables. Cotton and tobacco are also grown. The prov. is rich in mineral wealth, and asbestos, copper ore, fireclay, gold, graphite, gypsum, iron ore, lead and silver ore, nitre, oil shale, limestone, and marble, manganese ore, mica, nickel ore, and tin ore are found. Coal is mined in the Klip R., Vryheid, and Utrecht dists.

The wild animals still found include the leopard, panther, jackal, hyena, wild cat, hippopotamus, crocodile, different species of antelope, but the larger animals are gradually disappearing. There are many varieties of snakes, including the python. The birds include the vulture, eagle, secretary-bird, parrot, flamingoes, many of them of brilliant plumage but mostly songless. The Giants' Castle Game Reserve (50,000 acs.) is situated in the Estcourt dist. in the Drakensberg Mts. It contains eland, blesbok, red hartebeest, and numerous species of small game, and birds. The Natal National Park, although not essentially a game reserve, exists for the preservation of the natural flora and fauna of the Berg. It is 10,000 ac. in extent, is 65 m. from Ladysmith, and

embraces some of the finest scenery in the Drakensberg Mts. The fisheries of Natal are notable. The prin. classes of edible fish found are red and silver bream, bass, rock cod, barracudas, and steenbras. Whaling operations begin in May and end in Oct., the species of cetacei captured being sperm, humpback, finner, etc. Porpoise and dolphin abound all the year round on the coast. Rod and line salt-water angling on the coast is popular and well organised. All fishing in Natal

(Europeans 232,900; non-European, 1,949,800).

Administration.—By the South Africa Act, 1909, which constituted the Union of S. Africa, inaugurated in 1910 by the duke of Connaught, Natal sends eight members to the Union Senate and sixteen members to the House of Assembly. It has an elected prov. council of twenty-five members. These twenty-five elect four members to act with the administrator as the executive. The administrator is



South African Railways and Harbour

PIETERMARITZBURG: THE MAIN SHOPPING CENTRE

is administered under the Natal Fisheries Ordinance of 1910 by the Natal Fisheries Advisory Board. The total revenue for 1946-47 (including Union subsidy) was £5,376,814; and the expenditure £4,753,142.

The pop. of Durban, the prin. seaport and manufacturing centre of the prov., is 338,800, including 117,000 Europeans. Pietermaritzburg (the seat of gov.) has a pop. of 63,100 including 27,000 Europeans. Ladysmith (*q.v.*), Dundee (pop. white, 1900; total 6700), and Newcastle (pop. white, 2300; total 9700) are other towns. Communication is easy; the total railway mileage, operated by the administration, is 1511 m. The construction of 173 m. of N. mail lines, i.e. from Pietermaritzburg to Glencoe, was completed in 1926. A wireless installation for ship to shore working has been estab. at Durban. The total pop. in 1946 was 2,182,700

chosen by the governor-general of the Union in Council. He holds office for five years. The gov. of Zululand is in the hands of a prov. council and an administrator appointed by the governor-general. Its executive consists of four members. There is a native High Court in Natal with five judges to deal with peculiarly native cases.

Education.—With the exception of higher and vocational education, which is under the control of the Union gov., education comes under the prov. administration. A univ. college is at Pietermaritzburg, and over 319 primary schools for Europeans, and forty-two secondary and intermediate, all supported entirely or partly by gov. funds. For non-European children, there are 954 native schools; 137 Asiatic and thirty-four other coloured schools, state and state-aided. There are, besides, technical

colleges, a school for the training of teachers and a school of physical culture.

Religion.—The Christian pop. consists of members of the Church of England, with a bishopric at Pietermaritzburg, Rom. Catholics, with a bishopric at Natal, Wesleyans, Baptists, Presbyterians, and Independents.

History.—Vasco da Gama is reputed to have passed what is now Durban on Christmas Day, 1497, naming the country Terra Natalis, after the natal day of Christ; evidence, however, points to the fact that it was Pongoland which da Gama discovered. With the exception of the purchase of the bay of Natal by the Dutch in 1685, arising out of the adventures of Van der Stel's expedition, the hist. of European settlement in Natal commences at the close of the first quarter of the last century; and prior to 1823, only a few ships had touched on the coast for wood and water. In 1823 Lt. Farewell landed in the bay, and later, one Fynn was sent overland to obtain a grant of ter. from Chaka, the formidable paramount chief of the Zulus. Permission to settle was obtained from Chaka, but Chaka was assassinated in 1828 by Dingaan, his half-brother, and whose followers were hostile to the white settlers and their native allies. Matters were not settled until 1831, when Fynn was recognised as the 'great chief of the Natal Kaffirs.' In 1835 Dingaan granted a concession of land to Capt. Gardiner, who formed a Brit. colony at Durban. In 1837 the Boers, trekking N. from Cape Colony, first entered Natal, and having crushed the Zulus at Blood R., Dec. 1838, attempted to estab. a republic, and in 1840 the flag of the Dutch republic of 'Natalia' was in fact actually hoisted on the shores of the bay and was followed by a proclamation taking possession of all land between the Tugela and Black Umfolozi Rs. The Brit. Gov. refused to acknowledge the independence of the new state, and in 1842 a small force was sent to drive the Boers out, but was repulsed. One of the settlers, Richard King, however, rode through the Boer lines, a distance of 600 m. to Grahamstown and so secured relief. On Aug. 8, 1843, Natal was finally proclaimed a Brit. colony (annexed to Cape Colony) and the Boers moved westwards to the Transvaal. In 1856 Natal was declared an independent colony. In 1879 Cetewayo, king of the Zulus, was defeated and captured, and in 1897 Zululand was annexed to Natal. In 1881 the Transvaal Boers invaded the country and defeated the Brit. at Majuba Hill (q.v.). In the war of 1899–1902, Natal was the scene of some of the fiercest fighting, Elandslaagte, Glencoe, Ladysmith, and the second battle of Majuba Hill. After the war, Utrecht, Vryheid, and part of Wakkerstroom were added to Natal. In 1906 there was a formidable Zulu rising along the Tugela R., which was suppressed with great loss to the natives. In 1907 there was another outbreak which ended in the arrest of Dinizulu (d. 1913). On May 31, 1910, the colony of Natal was merged in the Union of S. Africa, becoming

an original prov. of the Union. See H. Brooks, *Natal*, 1876; J. Ingram, *Natalia*, 1897; R. Russell, *The Garden colony: the Story of Natal and its Neighbours*, 1910; A. T. Bryant, *Olden Times in Zululand and Natal*, 1929; C. Mackeurtan, *Cradle Days in Natal*, 1930; C. Fuller, *Louis Trichardt's Trek across the Drakensberg*, 1837–8, 1932; M. Nathan, *The Voortrekkers*, 1937; and A. F. Hatsterley, *Annals of Natal*, 1936–10.

Natal, tn. and seaport of Brazil, cap. of the state of Rio Grande do Norte. It stands on the r. b. of the Potengy R., 80 m. from Paraiba and 260 m. from Fortaleza. Exports sugar and cotton, as well as salt, carnauba wax, and hides. Its industries are cotton spinning and weaving and salt-refining. There are rail connections with Pernambuco, Maceio, and Paraiba. There is a large airport, used by transatlantic air services, 8 m. from the city. Pop. 63,000.

Natal, Port, see DURBAN.

Natchez, port of entry and co. seat of Adams co., Mississippi, U.S.A., 145 m. (direct) N.N.W. of New Orleans. Cotton is the chief industry, and there is shipping trade in cotton. There are also candy factories, canning factories, and a lumbering industry. The Jefferson Military College is at N. There are sev. fine churches. Its old name under the Fr. was Fort Rosalie and it remained a Fr. military and trading post till the Seven Years war, when it came into Eng. possession under the name of Fort Panmure. It was a bone of contention between the Amer. and Spaniards in the late eighteenth century, when the former were seeking outlets for their W. products, the Spaniards refusing to surrender it on the plea that England's title, under which the Amer. claimed it, was defective. It was in Sp. occupation from 1770 to 1798; in 1798 it became the cap. of the new ter. of Mississippi, but in 1820 the cap. was removed to Jackson. Pop. 13,500.

Natchez, tribe of N. Amer. Indians, whose original ter., extended along the gulf of Mexico, between Mobile and the Mississippi. They were nearly exterminated by the Fr. in 1730. The N. language is extinct.

Nathan: 1. Trusted adviser of King David who, in consequence of a vision, withdrew his approval of the king's purpose to build the Temple. He rebuked David for his peculiarly heinous sin, making him condemn himself, by means of the parable of the 'one ewe lamb' (2 Sam. xii.). 2. Name of a son, probably the third born to David by Bathsheba (2 Sam. v.). The right of succession to David passed to Salathiel, the descendant of N., who is supposed to be referred to in Zechariah xii. N. thus appears as an ancestor of Our Lord.

Nathan, George Jean (b. 1882), Amer. dramatic critic; b. at Fort Wayne, Indiana. He was educated at Cornell Univ., New York State, and the univ. of Bologna in Italy. He served at various times on the editorial staff of the *New York Herald* and as dramatic critic of various pubs. including *Harper's*

Weekly, Smart Set, and the *American Mercury*, the latter of which he founded with H. L. Mencken. In his critical work he is often mordant and always independent. Among his pub. works are *Bottoms Up* (1917); *The Popular Theatre* (1918); *Comedians All* (1919); *The New American Credo* (1927); *Art of the Night* (1928); *Testament of a Critic* (1931); *The Avon Flows* (1937); *The Morning after the First Night* (1938); *Encyclopaedia of the Theatre* (1940); *The Entertainment of a Nation* (1942); *Since Ibsen* (1943); and an ann. theatre book (since 1942).

Nathan, Robert (b. 1894), Amer. author of short novels, with a public that is small but select, b. New York City. He was educated at Harvard Univ. Most of his novels like *Autumn* (1921); *Youth Groves Old* (1922); *The Puppet Master* (1923); *The Fiddler in Bally* (1926) are distinguished by their note of gentle wistfulness and a mellow style. In *Jonah* (1923, pub. in England as *The Son of Amittai*), an adaptation of the Biblical story, he struck a new note of irony. This was reinforced in his *There Is Another Heaven* (1929), the story of a converted Jew's experience in a very Protestant heaven. His other works include *One More Spring* (1933); *Road of Ages* (1935); *Winter in April* (1938); *Portrait of Jennie* (1940), and *They Went on Together* (1941).

Natick, tn. of Massachusetts, U.S.A., in Middlesex co., 16 m. W.S.W. of Boston. Manufis. include boots and shoes, baseballs, and shirts. There are canned goods factories, boxes and corrugated paper are manufactured, and fruit farming is important. Pop. 13,800.

National Anthems. Patriotic hymns, to be sung at public ceremonies and on similar occasions are of comparatively recent date. The Brit. *God Save the King* assumed its present form about 1740-1745 and has been attributed to Henry Carey (1692-1743), though it is possible that it developed out of an old folk song. Carey evidently did not claim authorship, the first claim on his behalf being made by his son in 1795 who wished to get a pension from the gov. on that ground. He stated that his father wrote the words in 1745 or 1746, despite the fact that his father d. in 1743 (Scholes). The most important claimant to an early version of it is John Bull (1563-1628). It is not certain either who wrote the words or composed the tune of *God Save the King*, or who (supposing them to have been written) brought them together as the Brit. National Anthem. All that is known is that a version of words and tune was first pub. in a collection called *Thesaurus Musicus*, 1744, and that the popularity of the song as an expression of loyalty to the House of Hanover dates from the landing of the Young Pretender in 1745. (The versions in *Thesaurus Musicus* (1741 and 1745) differ slightly from each other and from the present form—Scholes.) The keyboard piece of 1619, which has caused the attribution to Dr. John Bull, is not very much more like the anthem than any of the other songs and pieces in a galliard rhythm, which have been supposed to

have contributed something to its outline. The air has been adopted by Switzerland to the words *Rufst du, mein Vaterland*; by Germany in *Heil dir im Siegeskranz*; by Denmark, in *Heil dir dem Liebenden*; while, in the U.S.A. the air is sung to *My Country, 'tis of thee*, by Samuel Smith.

Other N.A. are:

Abyssinia: *Etiopia hoy, des yibalist*; words by a group of Abyssinian scholars (1930); tune by M. K. Nalbandian (1925).

Albania: *Alla bandiera*; author of words unknown; tune by E. A. Mario (Giovanni Gaeta, 1937).

Argentine: *Oid mortales, el grito sagrado Libertad*; words by Vicente López y Planes (1813); tune by José Blas Parera, revised by Juan P. Esnaola.

Armenia: words by Sarmen; tune by Khatchaturian (1945).

Australia: *Advance Australia fair* (broadcast, but not actually adopted as a national anthem); words by P. Dodd McCormick (b. before 1916).

Austria (Imperial): *Gott erhalte Franz den (or unsern) Kaiser*; words by L. Haschka; tune by J. Haydn (1797). (Republican): *Österreichische Bundes-hymne*, 'Sel gesegnet ohne Ende'; words also by L. Haschka; tune as above. (Republican, 1920-29) *Deutsch-Österreich, du herrliches Land, wir lieben dich*; words by K. Renner; tune by Kienzli (1920). (Nazi) *Lied der Jugend*, 'Ihr Jungens schliesst die Reihen gut'; words and tune by H. Leopoldi (c. 1933). From 1946, *Bruder, reicht die Hand zum Bunde*; tune by Mozart.

Bavaria: *Bayern, mein Heimatland*; words by F. Beck; tune by F. Lachner (1848); also *Gott mit dir, du Land der Bayern*; words by M. Üchsner; tune by F. M. Kunz.

Belgian Congo, see Congo.

Belgium: *La Brabançonne*, 'Qui l'aurait dit de l'arbitraire'; words by Jennoval (1830); tune by P. van Campenhout (L. A. H. Dechez, 1830). **Flemish:** *De Flaamsche Leruw*; words by H. van Peene; tune by K. Miry.

Bolivia: *Bolivianos, el hado proprio*; words by Ignacio de Santjines; tune by B. Vincenti.

Brazil: *Ouviram do Ypiranga as margens placidas*; words by J. O. Duque Estrada; tune by F. Manoel da Silva. (Earlier) *Seja um pâlio tuz*; words by M. Albuquerque; tune by L. Miguez.

Bulgaria: *Shoumi Maritza*; words by Merreck; tune by G. Sebek.

Burma: *Nain-gan-daw-Thachin*, a revision of the *Doh-Ba-Ma song* composed by M. B. Sayn Tin in 1930 and finally amended by the Constituent Assembly in 1947.

Canada: *The Maple Leaf for ever*, 'In days of yore, from Britain's shore'; words and tune by A. Muir (1867). (Fr.) *O Canada:* *Terre de nos aïeux*; words by A. B. Routhier (1880); tune by C. Lavallée (adapted from the priests' march in Mozart's *Magic Flute*).

Ceylon: No decision regarding the future Singhalese national anthem has been made (1949).

Chile: *Dulce patria*, 'Ha cesado la

lucha sangrienta'; words by Eusebio Lillo (1847); tune by Carnicer (1828).

China: *Tsung-kwuh hiung li jüh dshou tiän*; author of words and composer of tune unknown (1912). (Democratic) *The Song of K uomintang*; words by Sun Yat-Sen; tune by Ch'eng Muo-Yün (1928).

Colombia: *Oh! Gloria inmarcesible, 'Cesó la horrible noche'*; words by R. Núñez; tune by O. Sindici (c. 1905).

Congo (Belgian): *Vers l'avvenir; Naar wijden zijd*, 'Le siècle inarçé'; 'De tijd spoedt heen'; words by G. Th. Antheneus, tune by Gevaert (1908).

Costa Rica: *Noble patria, tu hermosa bandera*; words by J. M. Zoledón; tune by M. M. Gutiérrez (1821, in use from 1853).

Cuba: *Himno Bayanés*; 'Al combate corred bayaneses'; words and tune by Pedro Figueredo (1868).

Czechoslovakia: Combination of *Kde domov můj?*; words by J. K. Tyl; tune by Skron (1831), and *Nad Tatrou sa blyska*; words by J. Mabuška (1844); tune traditional (first officially used 1919).

Denmark *Kong Kristian stod red højren must*; words by J. Ewald; tune by J. E. Hartmann (from opera *Fiskerne*, 1780); also *Der er et yndigt land*; words by A. Oehlenschläger; tune by H. E. Kroyer (twentieth century). a., 'Dengang jeg drag afsted'; words by F. Faber; tune by J. O. E. Horneman (twentieth century).

Dominican Republic: *Quisqueyanos ralentes, aleemos*; words by Emilio Prud'homme; tune by J. Reyes (1900).

Ecuador: *Salve! Oh patria, mil veces, 'Indignados fusilados del vugo'*; words by J. L. Mera; tune by A. Neumann (1866).

Egypt: (march) *Hani an bē au da to samil ma kan*; author of words unknown; tune possibly by Verdi.

Ireland, see Ireland, Republie of.

England, see above.

Estonia: *Mu isamaa, mu oon ja roon*; words by J. Jannsen (1865); tune by Paetus (1848).

Ethiopia, see Abyssinia.

Finland: *Maamme*, 'Oj maamme suomi synnyttaa'; words by J. L. Runeberg (originally in Swedish, 1813); tune by Paetus, as for Estonia. A second tune by Paetus was also adopted.

France: *La Marseillaise*, 'Allons, enfants de la patrie'; words and tune by Rouget de Lisle (1792).

Germany (imperial) *Heil dir im Siegerkranz*; words by H. Harries (1790, adapted by B. G. Schumacher, 1793); tune as for Great Britain; also, after 1870, *Die Wacht am Rhein*, 'Es braust der Ruf wie Donnerschall'; words by M. Schneckenburger (1810); tune by C. Wilhelm (1854). (Republiean) *Deutschland, Deutschland über alles*; words by H. A. Hoffmann von Fallersleben (1841); tune by J. Haydn, as for Austria. (Nazi) *Horst Wessel Lied*, 'Die Fahne hoch, die Reihen dicht geschlossen'; words by Horst Wessel; the tune may have been adapted from a Bohemian comic song; in use 1933-45.

Greece: *Se gnorizo apo ten kopsi tu spaljju ten tromere*; words by D. Solomos (1827); tune by N. Mantzarlos; in use since 1873.

Guatemala: *Guatemala feliz!*; words by J. J. Palma; tune by R. Alvarez, in use from 1896.

Haiti: *La Dessalinche*, 'Pour le pays, pour les ancêtres'; words by J. Lhérisson; tune by N. Giffard (1903).

Hawaii: *Hawai'i ponoi*; author of words and tune unknown, but possibly by Kula-kana, king of Hawaii (c. 1880).

Holkar's Dominions, see Indore.

Holland: *Wilhelmus van Nassouwe*; words by Philip van Marnix (c. 1570); composer of tune unknown (first pub. 1626); also *Wien Neerlandsch bloed door de aderen rieelt*; words by H. Tollens; tune by Jan Wilms (1820).

Honduras: *Compatriotas, de Honduras los fueros*; words by A. C. Coello; tune by C. Hartling.

Hungary: *Himnusz*, 'Ysten áldd meg a Magyart'; words by Kókolyay (1823); tune by Erkel (1845); usually followed by *Székely*, 'Házádnak rendületlenül légy hivé óh magyar!'; words by M. Vörösmarty (1836); tune by B. Egressy (1844).

Iceland: *O Gud rors land*; words by M. Joachimsen (1871); tune by S. Sveinsson.

India: *Jana Gana Mana* by Rabindranath Tagore. In addition, *Bande Matram* by Bankim Chandra Chatterjee is honoured as a national song.

Indore: *Prabho prarth ana parisa amuchi*; author of words unknown; tune by Jud.

Iran, see Persia.

Iraq: *Royal Salute* (march); no words; tune by A. H. Murray.

Ireland, Republic of: *Soldier's Song*; words by Patrick Kearney; tune by Patrick Heaney (c. 1917).

Israel: *Hatikva* (The Hope); words by Naphtali Herz Imber, in 1878. The song was first called *Hatikvah*. Only eight years later Imber called it *Hatikva* in his collection *Barkai* (Jerusalem 1886). There are two views as to the melody and composer. According to the one, the tune was taken from *Ma Vlast* (My Country), a cycle of six symphonic poems by the Czech composer Smetana. According to the other, it had been composed by a Sephardic Jew, Henry Busato (or Russotto) on the basis of the liturgical music of *Hallel* (Psalm 117).

Italy: *La Marcia reale*; no words, tune by G. Gabelli (1831). (Sung in S. Italy): *Inno di Garibaldi*, 'All' arni, all' armi, si scopron le tombe'; words by L. Merenda; tune by A. Olivieri (1858). (Festive) *La Giorinza*, 'Su, compagni in forti schiere'; words by M. Manni; tune by G. Castaldo after G. Blanc (1921).

Japan: *Kimagayo*; the words are from the ninth century; tune by Hayashi Hiromi, revised by F. Eckert (1880). Jewish, see Israel.

Jugoslavia, see Yugoslavia.

Latvia: *Diers, sveli Latviju*; words and tune by K. Baumanis.

Liberia: *Salve, Liberia, Salve!*; words by President Warneel, tune by O. Luca (1860).

Lichtenstein: *Oben am deutschen Rhein tehnzt sich Lichtenstein*; words by H. H. Juach (1850); tune as for Great Britain.

Lithuania: *Lietura tycne mūsu*; words and tune by V. Kudirka (1918).

Luxembourg: *Ous Hénecht*, 'Wô d' Uolzécht durech d'Wilson zët'; words by M. Lentz (1850); tune by T. A. Zinnen.

Malta: *Tifhira lil Malta*, 'Int sabiha, Malta tâna'; words by G. A. Vassalla; the tune is a Bersaglieri song adapted (twentieth century). After 1942: 'Lil din l'art Hej-wa'; words by C. Psoula; tune by R. Samut.

Mexico: *Mexicanos, al grito guerra*; words by F. G. Bocanegra; tune by J. Nuno (1854).

Montenegro: words by John Sonndechitch; composer of tune unknown; also *Onam, onamno za brda ona*; words by Prince Nicholas (1867); tune by Davorin Jenko.

New Zealand: *God defend New Zealand*; words by Thomas Bracken; tune by R. A. Horne, not consistently used until 1940.

Newfoundland: *When the sun rays crown thy pine-clad hills*; words by Sir Charles Cavendish Boyle; tune by Sir H. Parry. (This does not displace *God Save the King*.)

Nicaragua: *Hermosa Soberana*; words by Blas Villatas; tune by A. Cousin. After 1917: words by S. I. Mayorga; composer of tune unknown.

Norway: *Ja, vi elsker dette landet*; words by Bjornson; tune by Nordraak (1859).

Orange Free State: *Heft, Burgers, 't bed der vryheid aan*; words and tune by Hamelberg.

Pakistan: At the end of 1949 no decision regarding a national anthem for the dominion had been made.

Palestine: *Hatikrah* (Hope), 'While even yet unchanged'; Heb. words by N. H. Imber; Eng. by N. Salaman; composer of tune unknown (1936).

Panama: *Alcanzarás por fin la victoria*; words by Gerónimo de la Osa; tune by S. Jörge (1903).

Paraguay: *Paraguayos, República ó muerte*; words by F. Acuna de Figueroa; tune by F. Dupey.

Persia: *Shâhshân--a mā Zandah bâdi*; words by S. Afšar; tune by N. Moghaddam (c. 1934).

Peru: *Somos libres, seguiremos lo siempre*; words by José de la Torre Ugarte; tune by J. B. Alcedo (1821).

Philippine Is.: 'Tierra adorada' (*Marcha nacional filipina*); words by J. Palma; tune by J. Felipe (c. 1898).

Poland: *Jeszcze Polska nie zginela*; words by J. Wybicki; tune possibly by Kleofas Oginski (1795).

Portugal (royal): *O patria, O rei, O povo*; words and tune by Pedro I. of Brazil, formerly Pedro IV. of Portugal (1822). (Republican): *Heiros do mar*; words by Lopez de Mendoza (1890); tune by A. Kell; used since 1910.

Prussia: *Borsigia*; words by G. R. Duncker; tune by Spontini (1818); also *Ich bin ein Preuse*; words by B. Thiersch; tune by A. H. Neithardt (1826).

Romania: *Trăiescă Regale, în pace și onor*; words by V. Alexandri; tune by E. A. Hübsch (1861).

Russia (imperial): *Bozhe Tsarya khran*; words by W. A. Zhukovsky (1833); tune by Lvov (1833). (Soviet to 1944): *L'Internationale*, 'Debout, les damnés de la terre'; words by Eugène Pottier (trans. into Russian, last in 1932); tune by Pierre Degoeyer. (Soviet, after 1944): *Gymn Sovetskogo Sojuza*; words by Sergey Mikhalkov and I. Registan; tune by A. V. Alexandrov (c. 1942).

Salvador: *Saludemos la patria orgulloso*; words by J. J. Cañas; tune by J. Aberte.

Scotland: *Scots wha hae wi' Wallace blid*; words by R. Burns (1793); tune traditional.

Serbia: *Srpska Himna*, 'Bože pravde, ti sto spase'; words by J. Djordjewić; tune by Davorin Jenko (1872).

Siam: *Tauasoen Barami*; source of words and tune unknown.

S. Africa (Union): *Die Stom van Suid-Afrika*; words by C. J. Langenhoven; tune by M. L. Villiers.

Spain (royal): *Marcha real*; no words; tune by an unknown Ger. composer (1770); also *Hymno de Riego*; author of words unknown; tune by Herta. (Republican): *Marcha granadera*, adapted, and Ger. Nazi and It. Fascist songs also used.

Sweden: *Du gamla, du fria, du fjällhöga Nord*; words by R. Dybeck; tune traditional (1814).

Switzerland: *Rufst du mein Vaterland*; words by J. H. Wyss (1811), with Fr. and It. trans.; tune as for Great Britain; also *Schweizerpsalm*, 'Trittst im Morgenrot dahin'; words by L. Widmer; tune by Josef (Father Alberik) Zywyssig (1841).

Transvaal: *Kentjig dat volk vol heldenmoed*; words and tune by Catherine Félicie van Rees.

Tunisia: *Marche beuricate*; no words; tune by an It. composer (1881-83), adapted by Sidi-Sadoock.

Turkey: *Istiklal marsi* (March of Independence); no words; tune by Vittorio Radeglia (1921).

U.S.A.: *The Star-Spangled Banner*. 'Oh, say, can you see, by the dawn's early light?'; words by F. Scott Key (1814); tune by J. Stafford Smith; officially adopted 1931; earlier *Hail Columbia*; words by J. Hopkinson; tune by Frys (c. 1800). U.S.S.R., see Russia.

Uruguay: *Orientales, la patria ó la tumba!*; words and tune by J. Coppetti.

Venezuela: *Gloria al bravo pueblo*; words by V. Salas; tune by J. Landeta (after 1810).

Wales: *Mae hen wlad fy nhadau* (Land of my Fathers); words by E. James, Eng. by John Owen; tune by J. James.

Westphalia: *Ihr mögt den Rhein, den dolzen, meisen*; author of words unknown; tune by J. Peters.

Württemberg: *Preisend mit viel schönen Reden*; words by J. Kerner (1826); tune traditional.

Yugoslavia: A compound of the Serbian hymn *Bože pravde* (see Serbia), the Croatian hymn *Lijepa naša domovino*; words by A. Mihaloč; tune by Lichtenegger, and the Slovene hymn *Naprej zaštarla Slav*; words by S. Jenko; tune by D. Jenko.

Zanzibar: National march for military band by Sir Donald Francis Tovey.

National Art-Collections Fund (incorporated by Royal Charter), The Wallace Collection, Manchester Square, London, W.1. Founded in 1903 to organise public opinion and secure works of art of all times to enrich the museums and galleries of the Brit. Commonwealth. The society has raised nearly £700,000 for the purchase of works of art. It has acquired by gift, bequest, or purchase many thousands of such works for presentation to public museums and galleries, including pictures, drawings, lithographs, etchings, and engravings of almost every period and school. MSS., and illustrated books, porcelain and pottery, both of the E. and of the W., armour, coins and medals, enamels, bronzes, silver and other metal work, jewellery, ivories, furniture, lace, embroideries and textiles, statues, and other objects of plastic art. Membership is open to all. Each member makes a minimum ann. contribution of one guinea and receives various privileges from museums and galleries, opportunities of visiting private collections not otherwise open to the public, and an illustrated ann. report. Management: committees and secretary.

National Assembly, first of the Fr. revolutionary assemblies, lasting from 1789 to 1791; since its chief work was the formation of a constitution, it is often called the Constituent Assembly.

National Assistance Act (1948). Fundamental purpose of this Act was to achieve the final replacement of the poor law by entirely new services founded on modern conceptions of social welfare. Under the Act a National Assistance Board administers a state scheme of financial aid for all persons in need who fall outside the national insurance scheme (see NATIONAL INSURANCE ACT (1946)), or whose requirements are not wholly met from that or any other source. The cost of this service falls on the Exchequer. Provision is made for a local gov. welfare service, of which an important feature is the provision of residential accommodation for old and infirm people and others who require care and attention. Residential hostels, when built, will be open to all, irrespective of means, and they will provide accommodation in return for payment. Sick persons who need hospital treatment are the responsibility of the national health service. See also NATIONAL HEALTH SERVICE ACT (1946). The local authority welfare service also extends to the blind and other handicapped persons.

The only qualification for national assistance is the need according to general standards prescribed in regulations requiring parl. approval. Any person aged sixteen years or over who is in need may apply for assistance, and where need is estab., the assistance will provide for any dependents as well as the applicant. Discretionary power is given to deal with special cases. There is no household means test. Resources as well as requirements of applicants and their wives are considered jointly. No account is taken

of the income of earning sons and daughters, but they will be deemed to be making a reasonable contribution towards rent and other household expenses. The directions about treatment of cap. in the Act are that the first £375 of War Savings shall be ignored. Capital not so disregarded will also be ignored if it is less than £75. If it amounts to £75 or over, but not more than £400, it will reduce the weekly assistance by 6d. for the first £75, and 6d. for each further complete £25. Assistance is not generally payable if capital exceeds £400. Applications will be dealt with by local officers of the board. There is a right of appeal. A condition of assistance may be registration for employment, and persons who neglect or refuse to maintain themselves or their dependents may be refused assistance unless they attend a course of training or instruction or enter a re-estab. centre. Re-estab. centres may also be used for vagrants. Local authorities are also obliged to provide and maintain temporary accommodation for them in reception centres. It is a responsibility of the National Assistance Board to make provision whereby 'persons without a settled way of living may be influenced to lead a more settled life....'

The second group of services are under the local authority, and include residential accommodation for the aged, the infirm, and others, with special welfare services for handicapped persons. These services are entrusted to co. and co. bor. councils in England and Wales and co. councils and large burghs in Scotland. The residential accommodation, board, lodging, and attendance, is intended for all who cannot wholly look after themselves. It includes amenities such as hot and cold water and laundry services. The local authority fixes a standard charge which those who can afford it will pay in full. Those who cannot afford it will pay according to their resources and commitments, subject always to a minimum of 2s. a week, and every one is assumed to need 5s. a week pocket money. Thus a person with a retirement pension of 26s. a week and no more will pay 21s. and keep 5s. Persons with less than 26s. a week will be referred to the National Assistance Board to have their income made up to this sum. Local authorities are also empowered to extend to the deaf, the dumb, and the crippled the same welfare services which are provided for the blind. The authorities may arrange for voluntary organisations to act as their agents in providing residential accommodation and specialised welfare services. The Act requires the registration of private institutions for the care of the old and disabled, and local authorities are empowered to inspect and withhold registration in unsatisfactory cases. Liability for maintenance which formerly rested on a wide range of relatives is reduced by the Act to a simple liability of a man to maintain his wife and children and a woman to maintain her husband and children.

It was estimated (in 1947) that the numbers of persons to be transferred to

the National Assistance Board would include 430,000 on outdoor relief and 72,000 receiving blind domiciliary assistance. In Sept. 1947 supplementary pensions were being paid to 300,000 old age and widow pensioners, and unemployment and other allowances to 30,000 persons. Some 50,000 sick people then in Poor Law institutions and 18,000 mental cases were to be transferred to the national health service. The non-sick, who were to remain with the local authority and benefit from residential accommodation, totalled 40,000. Some 30,000 children deprived of normal life were to come under the child care services of the Home Office. The additional cost of national assistance and non-contributory pensions which would fall on the Exchequer under the Act was estimated to be about £20,000,000 a year at the outset. The transfer of services will relieve local authorities of expenditure amounting to about £18,500,000 a year. Expenditure incurred by local authorities in exercising their new statutory duties will fall on local rates. See also POOR LAWS.

National Association of Boys' Clubs, co-operates with local education authorities to enable local voluntary youth organisations within their area to function effectively and to secure support for the association's local clubs and organisations in the service of youth. The Association has also initiated schemes by which training for youth leadership could be more concentrated, and planning more systematic than before 1939. The association has a permanent centre where courses in art, drama, music, and crafts can take place throughout the year. It also has a centre where senior club members can be trained on a national scale, following training in local courses, to understand more fully the club method and their responsibilities to translate that understanding into action in home and work. The purpose of the association's scheme of planned development is to ensure that, given the resources and money, a large and essential increase in the number of boys' clubs could be undertaken and that they would have adequate leadership, premises, and equipment. The association receives generous assistance from the King George's Jubilee Trust and great encouragement from the Ministry of Education. The headquarters of the association are at 17 Bedford Square, London, and the president is the duke of Gloucester. See also YOUTH ORGANISATIONS OF GREAT BRITAIN.

National Association of Girls' Clubs and Mixed Clubs, exists to see that clubs are available when and where they are needed, to help clubs to find the right leaders, and in close collaboration with the local education authorities, other voluntary associations, and the churches, to provide these leaders with expert help and advice. The youth clubs affiliated through some fifty-three local associations number 1900, with a membership of 120,000. Some of these clubs are in large industrial centres and are seven-night-a-week clubs with programmes ranging from 'make-do-

and-mend' to tennis and football; others are in remote hamlets where country boys and girls, once or twice a week, enjoy opportunities for the amusement and education which club life offers. See also YOUTH ORGANISATIONS OF GREAT BRITAIN.

National Association of Women's Institutes, see WOMEN'S INSTITUTES.

National Bank of Australasia, estab. in 1858, acquired the undertakings of the Colonial Bank of Australasia in 1918 and of the Bank of Queensland in 1922. Authorised capital, £10,000,000; issued, £6,800,000. Head office, Melbourne.

National Bank of Egypt, The, founded by Sir Ernest Cassel, and incorporated by khedivial decree, June 25, 1898, acquired the Egyptian business of Lloyds Bank in 1926. In 1939 an agreement was reached for a new charter for forty years until 1979 and constituting the bank as the central bank for Egypt. Authorised capital, £3,500,000; issued, £3,000,000. Head office in Cairo.

National Bank of India, estab. in Calcutta, Sept. 29, 1863. Registered in London on March 23, 1866. Capital authorised and issued £1,000,000. In 1919 the capital was increased from £2,000,000 to £4,000,000. Head office, London.

National Bank of Mexico, estab. in Mexico, Aug. 16, 1881, as Banco Nacional Mexicano; name changed in 1884. In 1934 new statutes were adopted in accordance with the new banking law. Authorised and issued capital, pes. 16,000,000. Head office, Mexico. The bank directly controls Pan-Amer. Trust Company (incorporated in state of New York).

National Bank of Scotland Limited, The, was estab. in Edinburgh in 1825 as the result of the amalgamation of three distinct banking ventures projected in the previous year. When business commenced the paid-up capital was £500,000 and early in the bank's hist. a comprehensive branch system was decided upon. In 1831 the bank obtained a charter of incorporation. Two years later it took over the Commercial Banking Company of Aberdeen, and in 1836 the Perth Union Bank was absorbed. A branch was opened in London in 1861, a step later followed by the other Scottish banking companies. An important event occurred in 1918 when Lloyds Bank Ltd. acquired a controlling interest by the purchase from the holders of almost the whole of the capital stock of the bank. A public issue of 'A' stock was made in 1938 and the present paid-up capital of the bank is £1,500,000 with reserve funds of £2,275,000. The total assets of the bank amount to £117,000,000. There are 195 branches and sub-branches with head office in Edinburgh.

National Book League, independent, non-profit-making, cultural society, was founded in 1944 as the successor of the National Book Council. The league's object is to promote the wider use and enjoyment of books, and most of its supporters are drawn from the general public, though many educationists, students, and members of the book trade also

belong to it. Among its corporate members are a large number of schools and most of Great Britain's public libraries, and there are overseas members in more than seventy countries. The league's activities cover every aspect of books, primarily from the reader's point of view, and also touch on the problems of authorship and book production. Frequent exhibitions; lectures on literature, including contemporary books and writers; a monthly journal, *Books*; a book information bureau which answers queries of every kind about books; children's book weeks, a pioneer movement originated by the league and supported by educational authorities all over the country; work for the wider use of technical books in industry—these are examples of the league's normal activities. The league was made officially responsible for the representation of books throughout the Festival of Britain, 1951. N.B.L. pubs. include book lists, reader's guides, and other aids both for the general reader and for the advanced student. In addition to its prov. branches the league has a London headquarters at 7 Albermarle Street, W.1, with exhibition galleries, members' rooms, and a specialised library of 'books about books.'

National Central Library, London, was founded in 1916 as the Central Library for Students. In 1930 it was reconstituted as the N. C. L. and in 1931 was incorporated under royal charter. Its original purpose, that of providing books for organised classes for adult education, has since been extended so that it is now the recognised national centre for the loan, between libraries of all kinds both within Great Britain and abroad, of books for study which cannot be obtained in any other way. It has also become a centre for the supply of information about books, and for the allocation of duplicate and 'unwanted' books to suitable libraries, including war-damaged collections, at home and abroad. The library lends, from its own stock, books on many subjects, with certain notable exceptions, such as books which are available at the local library, works of fiction, and the set text-books required for examinations. In addition, it is in a position to obtain on loan from other libraries a very large percentage of those books which it is unable to supply from its own shelves. It has, in this way, access to about 21,000,000 vols. as well as many thousand sets of periodicals. The library is maintained by a Treasury grant and by other voluntary grants and subscriptions. Persons desirous of obtaining books from the N. C. L. must apply to the librarian of their local, univ., or special library.

National City Bank of New York, The, has its head office at 55 Wall Street, New York. It was estab. in 1812. In July 1921 the Commercial Exchange Bank, on Jan. 1, 1922, the Second National Bank of New York, and on June 26, 1926, the People's Trust Company, of Brooklyn, were absorbed. The bank acquired in May 1929 the commercial banking business of the Farmers' Loan and Trust Company,

which changed its name to City Bank Farmers' Trust Company. The London city office is at 117 Old Broad Street, E.C.2. The bank has numerous branches throughout New York city, S. America, Europe, Cuba, India, China, and Japan. The business of the National Bank of Haiti was sold to the gov. of Haiti in 1935. Authorised and issued stock is \$77,500,000.

National Coal Board, see COAL MINES, NATIONALISATION OF.

National Convention, revolutionary assembly of France, consisting of 749 members chosen by universal suffrage, which on Sept. 22, 1792, supplanted the legislative assembly, proclaimed the republic, and condemned Louis XVI. to the guillotine. In spite of its difficulties and internal dissensions it succeeded in suppressing the Royalists in La Vendée and in the S., and notwithstanding the rest of Europe leagued against it, not only in the field, but in diplomacy. It laid the foundation of several modern Fr. institutions, and dissolved itself in favour of a directory of Five on Oct. 20, 1795.

National Council of Evangelical Free Churches, council of the Free Church Federation, founded in 1892. To it are sent representatives from the Presbyterian, Congregational, Methodist, and Baptist churches. The Federation has spread throughout America and the Dominions. The N. C. takes action when necessary on behalf of the federated churches. The monthly magazine, ed. for the N. C., is entitled *The Free Churchman*. The headquarters of the Council are at Memorial Hall, Farringdon Street, London, E.C.4.

National Debt, see PUBLIC DEPT.

National Dental Service.—Provision is made under the National Health Service Act, 1946 (q.v.), for treatment by dentists who join the service. Any dentist may at his option take part in the service not. Of some 10,000 dentists in general practice in England and Wales the number in the N. D. S. in 1949 was 9300. Dentists joining the service are in contact with the local executive councils for their respective areas. Local dental committees have been set up by the profession and are responsible for the appointment of three members for each executive council as well as for maintaining contact between the dental profession and the executive councils. Lists of dentists taking part in the service are available in post offices and executive council offices. There is no need to register with dentist. Patients are free to choose a dentist just as the dentist is free to accept them or not. The dental service provides free of charge all forms of treatment necessary for the restoration of dental fitness, and all repairs and replacements which are not due to carelessness. But a patient will pay the extra cost of certain treatment or appliances more expensive than is clinically necessary. In such cases the dentist will receive the normal fee from public funds and the patient will pay the extra cost in accordance with a prescribed scale. Such cases include metal dentures or the provision

of special dental treatment consisting of gold fillings, etc., when these are not rendered necessary by the patient's clinical condition; if they are clinically necessary, they will be provided without charge. Treatment falls into two main divs.—that which may be carried out without prior authority, and that which requires the prior authority of the Dental Estimates Board, consisting of a dental chairman, six dental members, and two lay members appointed by the minister of health. Treatment not needing prior authority includes all normal conservative treatment—*i.e.* prophylaxis, fillings and root treatment, extractions for the relief of pain or extractions not necessitating replacement by dentures (including any necessary anaesthetic), and ordinary denture repairs.* X-ray examinations for diagnosis and certain other treatment may likewise be carried out at once, subject to a limitation of cost. Treatment needing prior authority includes the removal of teeth otherwise than above, the provision of dentures, extensive and prolonged treatment of the gums, gold fillings, inlays, crowns, special appliances, and oral surgery.

Where a dentist gives treatment in his own surgery, he is paid on a prescribed scale of fees based on items of treatment carried out by him. Apart from those cases in which a patient is contributing some part of the cost of more expensive treatment provided at his request, payment is made by the executive council with whom the dentist is in contract. The scale of fees is based on the recommendations of the Spens Committee (pub. May 1948). The main recommendations are these: (1) If there were sufficient dentists in relation to the demand for their services to secure a spread of incomes comparable to that in 1938, arrangements should be made to ensure that, between thirty-five and fifty-four years of age, three-quarters of those dentists should receive net incomes of over £850 a year, one-half should receive incomes of over £1100, and one-quarter incomes of over £1400. (2) Until there are sufficient dentists to secure such a spread of incomes, a single-handed dentist using all appropriate assistance and working efficiently for 1500 hours a year at the chair-side, together with the hours necessarily spent outside the surgery, should receive a net income of £1600. Extra remuneration may be earned by experienced dentists under partnership agreements with junior partners or by employing salaried assistants; by dentists able to work more than 1500 chair-side hours a year without loss of efficiency; by dentists with special skill and experience acting as part-time consultants or specialists; and by dentists practising in especially unattractive areas. Under new regulations (since Feb. 1, 1949) any dentist earning more than a gross income of £4800 a year will have his earnings above this amount cut by half. This is an interim measure, pending a detailed review of the scales of payment given above.

National Film Library, official film

archive of Great Britain for the permanent preservation of films and film records of all kinds. Films are chosen for preservation by a selection committee on two grounds; either their significance in the hist. of the film as a form of art and entertainment, or their value as historical records of events, manners, scientific discoveries, etc. The library is dependent on the voluntary co-operation of the film industry in presenting films, and does not enjoy the privilege of statutory deposit which the Brit. Museum, for example, has in respect of books. Research into the best technical methods of film preservation, and the cataloguing and indexing of its material, are two of the library's most important functions. It also has a lending section, through which many of the most important films in the library can be borrowed by schools, film societies, and other non-commercial educational bodies. The library is a dept. of the Brit. Film Institute (q.v.) and a certain portion of the institute's Treasury grant is allocated to its work.

National Galleries, The. The National Gallery of London contains the most important collection of pictures in the United Kingdom. The building was erected in the classic style from designs by Wilkins, 1832-38, opened in 1838, and enlarged in 1860, 1876 (when a new wing was added by Barry at a cost of £80,000), and 1886; it stands on the N. side of Trafalgar Square. The nucleus of the collection was thirty-eight pictures of John Julius Angerstein (d. 1823), a wealthy merchant of Russian extraction; his collection, one of the most famous in England, had been formed with the aid of his close friend, Sir Thomas Lawrence. This collection was purchased in 1824 by Parliament for £57,000, but, there being no place in which to exhibit the pictures, Angerstein's house was bought for the purpose. The Angerstein collection included the Hogarth series, 'Marriage à la Mode,' 1743; Wilkie's 'Village Festival,' 1811; three Claude; and Titian's 'Venus and Adonis,' 1551. The largest painting in the collection was Sebastiano del Piombo's 'Raising of Lazarus,' 1517-19, and among other pictures acquired soon afterwards were Titian's 'Bacchus and Ariadne,' purchased in 1826, Annibale Carracci's 'Christ appearing to Peter,' 1826; Correggio's 'Vierge au Panier,' 1825; Reynolds's 'Holy Family'; Gainsborough's 'Market Cart'—these last two being presented by the Brit. Institution—Gainsborough's 'Watering Place'; and Copley's 'Death of Chatham.' The critic of the *Spectator* (April 14, 1838) singled out the following as 'unworthy of exhibition': Nicholas Poussin's 'Phineas and his followers turned to stone at sight of Gorgon,' Sir George Beaumont's landscape, 'Jacques and the Wounded Stag'; Hoppner's portrait of 'Gentleman Smith'; a portrait of Izaak Walton by Huysmans, and a moonlight study by Peter. Constable's 'Cornford' was acquired in 1837 by a committee of friends and admirers of the painter organised to acquire one of his most characteristic works for presentation.

to the gallery. A considerable sum is voted annually by Parliament for augmenting the number of pictures, and famous bequests include those of Beaumont (1826), Carr (1831), Olney (1837), Farnborough (1838), Vernon (1847), J. M. Turner (1856), Bell (1859), Peel (1871), Wyn Ellis (1876), Layard (1916), Salting (1916), Ludwig Mond (1924). The gallery is particularly rich in early It. masters and contains some of the best work of Raphael, Correggio, and Paolo Veronese. There are many important pictures of the early Sienese school, notably of Ugolino de Siena—'Procession to Calvary,' 'Two Apostles,' and 'SS. Bartholomew and Andrew'—and an exceptionally fine collection of pictures by the leading fifteenth-century painters, as Lippo Lippi, Signorelli—seven pictures, including 'The Nativity,' 'The Triumph of Chastity,' and 'The Adoration of the Shepherds.' Uccello—'The Rout of San Romano'—and Pollaiuolo—'Martyrdom of St. Sebastian.' In the Venetian school the gallery is almost unrivalled; e.g. there are Sebastiano del Piombo's masterpiece mentioned above and many of the outstanding works of Giovanni Bellini, besides Cannettolo's 'Interior of the Rotunda, Ranelagh,' Cima's 'Ecco Homo,' Crivelli's 'Madonna' and 'Our Lady enthroned, surrounded by Saints' (an altar-piece), a score of It. scenes by Guardi (acquired after 1910), Lorenzo Lotti's 'Lucretia' (bought by the National Art Collections Fund in 1927), Mantegna's 'The Agony in the Garden,' Tiepolo's 'Finding of Moses,' Tintoretto's 'Christ washing his Disciples' Feet,' 'The Origin of the Milky Way,' and 'Vincenzo Morosini' (purchased through the National Art Collections Fund (q.v.) and presented in commemoration of the National Gallery centenary, 1924), Titian's 'Venus and Adonis,' Bacchus and Ariadne,' 'Christ and the Magdalen: Noli me tangere,' 'Madonna and Child with SS. John and Catherine,' 'Portrait of a Man' (formerly called Ariosto), 'The Trinity receiving Charles V.: "The Gloria,'" and Paolo Veronese's 'Adoration of the Magi,' 'The Family of Darius before Alexander' (bought from Count V. Pisani in 1857 for £13,650), 'St. Helen: Vision of the Cross,' 'Scorn,' and 'Happy Union.' Of the painters of the Umbrian school, Perugino is represented by the triptych, 'The Madonna adoring the Child,' part of the altar-piece commissioned c. 1496 for the Certosa, Pavia; Piero della Francesca by 'The Baptism of Christ' and other panels; Raphael by seven pictures, among them being 'St. Catherine of Alexandria,' 'Vision of a Knight,' 'Madonna, Child, and St. John,' 'The Crucifixion'—a very early work (c. 1502) strongly influenced by Perugino (bequeathed to the gallery in 1924)—and the world-famous 'Ansdhei Madonna,' purchased from the duke of Marlborough in 1885 for £70,000. The Parma school is represented by Parmigianino's 'Vision of St. Jerome,' and by seven pictures of Correggio, including 'Ecco Homo,' 'Christ taking leave of his Mother,' and the very famous 'Mercury instructing Cupid before Venus' (purchased from the

Londonderry collection, 1834). The earlier school of Bologna is represented by the 'Pietà' of Francia and the later by the 'Ecco Homo' of Guido and specimens of the work of Annibale Carracci, notably 'Erminia takes refuge with the Shepherds.' Other outstanding It. paintings are 'The Mystic Marriage of St. Catherine of Alexandria and St. Catherine of Siena to Christ,' by Ambrogio Borgognone, Andrea Solario's 'Portrait of a Venetian Senator,' Moroni's 'Portrait of a Tailor,' Giovanni Dosso Dossi's 'Adoration of the Schools,' 'The Vision of S. Eustace' by Pisano (formerly called Vittore), and Fra Bartolomeo's 'Adoration of the Child.' There are sev. pictures of the Florentine school, but only one by Leonardo da Vinci, and it was not definitely accepted as authentic at first; this is 'The Virgin of the Rocks' of which there is an earlier version in the Louvre more Florentine in style. The picture was purchased from the earl of Suffolk in 1880. There are two pictures by Michelangelo—'The Entombment,' painted, apparently, c. 1495, and first recognised as by Michelangelo by Cornelius and Overbeck. It was bought from R. Macpherson, London, in 1868. The other picture is the 'Madonna and Child, St. John, and Angels,' painted c. 1494 and perhaps the artist's earliest picture. It was purchased from Labouchere's executors in 1870. Among the most notable Ger. pictures are 'St. Veronica' by William of Cologne, and Albrecht Dürer's 'The Painter's Father' (purchased 1904) and 'Portrait of a Senator.' The 'Duchess of Milan' by Holbein (the Younger) was purchased for the nation by the National Art Collections Fund in 1909 from the duke of Norfolk for £50,000. The same artist's 'The Ambassadors' was bought in 1890 from the earl of Radnor with the aid of gifts from Lord Rothschild and Lord Ivecagh.

The collection is rich in fine examples of early Flem. painting, such as specimens of the Van Eycks and their school. The 'Entombment of Christ' by Van der Weyden the Elder, the 'Reading Magdalene' by Van der Weyden the Younger, and the 'Exhumation of St. Hubert' by Dierick Bouts, are all admirable examples of the work of these painters. 'The Adoration of the Kings' by Pieter Brueghel was acquired through the National Art Collections Fund and other funds in 1921. Equally well represented are the later Flem. painters: Rubens by some thirty or more pictures, including 'The Rape of the Sabines,' 'Peace and War,' 'Conversion of St. Paul,' 'The Brazen Serpent,' 'Triumph of Julius Caesar,' Susanna Fourment (known as 'Le Chapeau de Paille'), 'The Triumph of Silenus,' and the famous 'Judgment of Paris,' which was painted 1635-36 and bought in 1844. Van Dyck is represented by many works, notably his 'Charles I.', which cost £17,500, and 'Lady and Child' (acquired in 1914). There is an equally full collection of great Dutch masters' paintings: Cuyp, with sev. pictures, mostly landscapes and river scenes; Frans Hals, portraits; Gerard van Honthorst, notably his

'Christ before Pilate'; Mabuse, whose 'Adoration of the Kings' was bought in 1911 with the aid of sev. funds and a special grant from the gov.; Ostade, with 'The Alchymist,' 'Courtship,' and 'Man with a Jug'; Jan Steen, with 'The Music Master' and 'Skittle Players'; Vermeer of Delft, with 'Lady standing at the Virginals' and 'Lady seated at the Virginals'; and a number of paintings by Rembrandt and Ruisdael. There are a score of pictures of Rembrandt, notably 'Portrait of an Old Woman,' 'Adoration of the Shepherds,' 'Descent from the Cross,' 'The Woman taken in Adultery,' 'A Jew Merchant,' 'Portrait of Himself (as an old man),' 'Portrait of Margaretha Trip (bought in 1899, a second picture of the same title being acquired in 1941), and Diana bathing.' Ruisdael is represented by many landscapes, with water-mills, while pictures acquired later include 'The Shore at Scheveningen' and many others acquired through the Salting bequest. There are also sev. notable paintings by Ter Borch or Terburg, including 'The Guitar Lesson,' 'The Peace of Munster,' and 'Portrait of a Gentleman.' Mention must also be made of Wouwerman (Philips), whose ten pictures include 'Halt of Officers,' 'Interior of a Stable,' 'On the Sea Shore,' 'Gathering Fangots,' and 'Bohemians.' Of the Antwerp school, David Teniers the Younger is well represented by many pictures, which include 'An Old Woman peeling a Pear,' 'Teniers's Château at Perck,' 'Winter,' 'The Surprise,' 'The Village Fête' ('Fête aux Chaudrons'), and 'The Cardplayers.' Of the school of Amsterdam Hobbema is conspicuous with 'View of Middleharnis,' 'A Village with Water-mills,' and a number of other scenes of castles, ruins, woods, and forests.

Among the pictures of the Fr. school are sev. fine landscapes by Claude (Claude de Lorrain), notably 'Landscape: Death of Procris' and 'Landscape with View of Rome' (ascribed); also prominent are Gerard David, with 'The Marriage of St. Catherine,' 'Canon with his Patron Saints,' and sev. others; Nicolas Poussin, with eight pictures, including 'Adoration of the Shepherds' (transferred from the Victoria and Albert Museum in exchange for other works, 1893), 'Bacchanalian Festival,' and 'Bacchanalian Dance'; Puvis de Chavannes, with 'Summer'; Manet, with 'Soldier examining the Lock of his Rifle' (acquired 1918); and Chardin, with 'La Fontaine' and 'The Lesson.' Of the Sp. school the gallery possesses an excellent portrait head of Philip IV. of Spain by Velazquez and another of that king hunting the wild boar. 'The House of Martha' (of the first or Sevillian period), 'The Adoration of the Shepherds' (attributed to Velazquez and purchased in 1853, and, above all, 'Venus and Cupid,' are also by the Sp. master. The last-named picture, known as the 'Rokeyb Venus,' was in the possession of Don Gaspar de Haro, Conde Duque de Olivárez, in 1682, later in that of Godoy, and eventually acquired by the National Art Collections Fund in 1906 for £45,000. The

pictures of Murillo here, like so many out of Spain, are not outstanding examples of that artist's powers, but mention may be made of 'The Immaculate Conception' and 'St. John the Baptist,' both acquired in 1924 by bequests. El Greco is represented by 'Luigi Cornaro' and 'The Agony in the Garden.' The 'Kneeling Friar' of Zurbaran is a specimen of that painter's work which is not rivalled either in or out of Spain, and also in the gallery are his 'A Franciscan' and 'A Lady as S. Margaret.'

The gallery is, naturally, very well provided with pictures by all the famous Brit. artists, but only a few representative works can be mentioned here: Constable, 'The Cornfield, or Country Lane,' 'The Hay-wain,' 'Flatford Mill,' and many other pictures from the Henry Vaughan and Salting bequests of 1900 and 1910 respectively; John Crome, 'Mousehold Heath'; Gainsborough, 'Mrs. Siddons,' 'The Painter's Daughters,' 'Ralph Schomberg,' 'Sir William Blackstone,' and nearly a score of others; Sir Thomas Lawrence, 'Queen Charlotte (acquired 1927); Millais, 'William Ewart Gladstone'; Reynolds, 'The Graces decorating Hymen' (bequeathed 1837), 'The Holy Family,' 'Self Portrait' (from the Peel collection), 'George, Third Duke of Marlborough and his Family,' 'Catherine, Lady Baunfylde,' and many others; Romney, 'Lady Hamilton' (a popular picture); 'The Beaumont Family,' and 'Lady and Child'; and Whistler, with two nocturnes (the 'Fire Wheel' and 'Cremorne Lights'). There is a large collection of Turner's works acquired through the Turner bequest. The popular favourites include 'Dido building Carthage,' 'Ulysses deriding Polyphemus,' 'The Sun rising through the Vapour,' 'The Fighting Temeraire,' 'Venice; the Bridge of Sighs,' and 'Yacht Racing in the Solent.'

Other and later (between 1929 and 1938) acquisitions include the following pictures: Jan Jansz Treck, 'Still Life'; Gerard Ter Borch, 'Portrait of a Lady,' supposed to be Hermanna van der Cruysse (bequeathed by Sir Otto Beit, 1931); Jan Liss, 'Judith and Holofernes' (presented 1931); a portrait of Dr. Johnson, described as 'from the studio of Sir Joshua Reynolds' (presented in 1930); and 'The Children of R. R. Graham Esq.' by Hogarth (presented through the National Art Collections Fund, 1931). The National Art Collections Fund, by securing the Rokeyb Velazquez, the Norfolk Holbein, and since then the 'Madonna and Child with Angels' of Masaccio (1916) and Tintoretto's 'Morosini' (1924), has taken the foremost place amongst the private benefactors to the gallery. Other acquisitions through this fund include Titian, 'The Vendramin Family in adoration before a Reliquary of the True Cross' (1929); Richard Wilson, 'On Hounslow Heath' (1929); 'Deathbed Scene or Visit to the Sick' (sixteenth-century Antwerp school) (1931); and Rubens, 'The Watering Place' (1936). Purchases or gifts in the decade immediately preceding the Second World

War include Canaletto, 'Regatta on the Grand Canal, Venice' (bequeathed by Lord Revelstoke, 1929); Reynolds, 'Self Portrait' (bequeathed, 1930); Gerard van Honthorst, 'St. Sebastian' (1930); Rosa Salvator, 'Portrait of the Painter' (presented by the sixth Marquess Lansdowne, 1933); Hopper, portrait of 'Rt. Hon. Charles Long' (1934); Corot, 'Study of a Woman' (1934); Gainsborough, 'John, Tenth Viscount Kilmorey' (1934); Bernardo Currilino, 'Purification of the Temple' (1935); J. S. Cotman, 'Seashore with Boats' (1935); Constable, 'Hadleigh Castle' (1935); Caspar Netscher, 'Portrait of a Lady' (1935); Ingres, 'Madame Moitessier seated' (1936); Alfred Sisley, 'A Landscape in Spring' (1936); Raeburn, 'Pringle Fraser' (portrait of a young man) (1937); D. G. Rossetti, 'The Girlhood of Mary Virgin' (1937); Filippino Lippi, 'Moses causes Water to flow from the Rock' (1937); Richard Wilson, 'The Thames near Marble Hill, Twickenham' (1937); Piero di Cosimo, 'The Battle of the Centaurs and the Lapiths' (panel) (1937); Degas, 'Combing the Hair' (1937); Peter de Wint, 'Harvesters' (1937); Raffaelino de Garbo, 'Virgin and Child with Two Angels' and 'Virgin and Child with the Magdalen and St. C. the Less of Alexandria' (1937); Van Dyck, 'The Virgin and Child adored by the Abbé Scagliola' (1938); David Cox, 'The Welsh Funeral, Bettws-y-Coed' (1938). (See supplementary catalogue of the National Gallery, pub. 1939).

Between 1937 and 1946 the gallery acquired about seventy pictures (not included in the supplementary catalogue pub. 1939 or in the director's report for 1937). Among them may be mentioned the following: Gerlaut, 'Horse frightened by Lightning' (acquired 1938); Rembrandt, 'Flora' (1938); Zoffany, 'Mrs. Oswald' (1938); Reynolds, 'Admiral Kingsmill' (1939); Lorenzo Monaco, 'Legend of St. Benedict' (1940); Matsui, 'Lady drawing' (1940); Dosso Dossi, 'Bacchanalian Scene' (1941); Niccolò dell' Abate, 'Landscape, with the Legend of Eurydice' (1941); Hogarth, 'The Stay-maker' (1942); Panini, 'Interior of St. Peter's' (1942); Titian, 'Catherine Cornaro' (1942); Dutch seventeenth century, 'Three Music-making Children' (1943); 'The Visitation' ascribed to Philippe de Champagny (1944); Giovanni di Paolo, 'Four Scenes from Life of John Baptist' (purchased from executors of J. Pierpont Morgan, 1944); Venetian sixteenth century, 'Landscape with Mythological Scene' (1944); Nicolas Poussin, 'Annunciation' (1944); 'Virgin and Child with Angels,' ascribed to Benozzo Gozzoli (1945); Greuze, 'Mine Gleon' (1945); Largillière, 'Monsieur Forest' (1945); Tiepolo, 'Deposition' (1945); Romney, 'Lady Hamilton,' his second portrait of her (1945); Dürer, 'Virgin and Child' (1945); J. F. Millet, 'Landscape with Storm' (1945); Portuguese school, 'Marriage of St. Catherine' (1945); ascribed to Sp. eighteenth century, 'Old Man holding Bottle' (1945); Nicolas Poussin, 'Worship of Golden Cal' (1945); Flem. seventeenth

century, 'Portrait of Man in Black' (1945); Reynolds, 'Landscape' (presented by the National Art Collections Fund, 1945); and Mantegna, 'Imperator Mundi' (final part of Mond bequest, 1946) (see the *Burlington Magazine*, Dec. 1940).

In 1930 the National Gallery was extended by the opening of new rooms for the exhibition of the work of the early It. masters, the cost being borne by Sir Joseph Duveen. Before the Second World War there were about 2000 pictures at the National Gallery, Trafalgar Square.



John H. Stone

THE NATIONAL GALLERY
TRAFAVGAR SQ., LONDON

Of these not more than about 850 were hung on exhibition; but the remainder were accessible at any time to any one who inquired of the head attendant. After the war only about 250 were exhibited (1945); but when the two larger galleries were reopened and other accommodation restored, about 400 were on view. The remainder of the collection could not be made accessible owing to the congested conditions of storage, though any individual picture can be produced if notice is given in writing. The National Gallery of Brit. Art, presented to the nation by Sir Henry Tate, and opened in 1897, is controlled by the trustees of the National Gallery. The Scottish National Gallery at Edinburgh, built during 1850-58 at a cost of £10,000, contains Gainsborough's 'Mrs. Graham,' and fine examples of Van Dyck, Raeburn, Greuze, Watteau, and Etty.

Dominion Galleries.--The National Gallery of Canada in Ottawa, founded by the marquess of Lorne in 1880, is governed by a board of trustees estab. under the terms of the National Gallery of Canada Act, 1913. It consists of a sculpture court and nearly a score of picture and print galleries. The collection includes the work of It. schools—from fourteenth-century Siennese to Botticelli, Veronese, Titian, Canaletto, Tintoretto; painters of the Dutch, Flemish, and Sp. schools—Ruisdael (Ruysdael), Jan Lievens, Rubens, Van Dyck, Goya, Murillo, and Hopper, Gainsborough, and many others of the Eng. school, Veronese's 'The Rest on the Flight to Egypt,' El Greco's 'St. Francis in Meditation'; Constable's

'Hampstead Heath,' and John Crome's 'Ruined Buildings' are recent accessions. There is also a section devoted to contemporary Brit. painting with the most complete collection of Canadian art in existence. The Art Gallery of Toronto (Instituted in 1912), has a permanent collection containing works by Bordone, Boudin, Canaletto, Constable, Corot, Courbet, Delacroix, Gainsborough, Augustus John, Monet, Orpen, Pissarro, Sargent, Sisley, Hogarth, Rowlandson, Renoir, and Fantin-Latour. Canadian artists are also well represented. The National Art Gallery of New S. Wales, in Sydney, was opened in a temporary structure in 1885, but a new building in freestone has taken its place. The present collection is valued at £157,000 and includes examples of Brit. and foreign modern artists—among them Poynter, Millais, Leighton, Peter Graham, A. De Neuville, Flildes, Shannon, Lavery, Clausen, and A. East. Recent additions include works by Corot, Boudin, Munnings, Orpen, and others. Two special courts are set apart for the works of Australian artists, which form the most representative collection in any Australian gallery—works by John Longstaff, George W. Lambert, Sir A. Streeton, W. Withers, Bernard Hall, Will Ashton, J. J. Hilder, and many others. The National Gallery of Victoria was incorporated in 1869 as the result of the appointment of a commission by the gov. to submit a scheme for the formation of a public museum, gallery, and school of art. The first permanent picture gallery, now known as the McArthur Gallery, was opened to the public in 1875. Galleries costing over £175,000 were subsequently added, including three in 1932 in a building erected mainly through the bequest of James McAllan of Richmond. In 1904 the sum of £189,000 was bequeathed by the late Alfred Felton for the acquisition of works of art or antiquities. Works by Turner, Watteau, Reynolds, Corot, Millet, De Wint, Orpen, Ruisdael, Lavery, Jan van Eyck, Burne-Jones, Bastien-Lepage, Puvis de Chavannes, Hoppner, Gainsborough, Allan Ramsay, Dupré, Courbet, Tintoretto, Titian, and numerous others have been purchased since 1905. Two courts of the National Art Gallery of S. Australia, in Adelaide, are devoted to Australian painters, and a fine collection has been built up. New Zealand's National Art Gallery, in Auckland, opened in 1888, contains two collections, one of which belongs to the city corporation, while the other is administered by a trust. The former consists mainly of pictures by both Brit. and foreign artists, with a section devoted to the work of New Zealanders. The latter, known as the Mackelvie collection from the name of its donor who bequeathed it in 1885, contains paintings representative of the modern school of Brit. and continental artists. The S. African National Gallery, founded in 1872, was taken over by the Cape Gov. in 1875 and the present gallery was built in 1928 and opened in 1930. It has paintings by Wilson Steer, Augustus

John, Sir W. Rothenstein, and a number of paintings by modern European artists.

European Galleries of Paintings.—The great collections of paintings on the Continent are those in the Louvre, Paris; the Prado, Madrid; the Uffizi and Pitti palaces of Florence; the Pinacoteca of the Vatican and the Villa Borghese, Rome; the Accademia of Venice; the Berea and other collections in Milan; the Art-Hist. Museum of Vienna; the Old and New Pinakothek of Munich; the Dresden Gallery; the Kaiser Friedrich Museum, Berlin; the Rijksmuseum, Amsterdam, and the Mauritshuis of The Hague; the Antwerp Museum of Fine Arts; and the Palais des Beaux-Arts in Brussels. The foundations of the collections of the Louvre were laid by Louis XI, and supplemented by Charles VIII, and Francis I. Similarly, the Prado owes to its kings the greater part of its treasure and to none more than Charles V. The Louvre is the largest national gallery in the world. It contains so many picture rooms, widely divided by corridors and stairs, that no fair comparison can be made with the London National Gallery otherwise than by adding to the latter the Tate, Wallace collection, Victoria and Albert Museum, and the pictures of the Brit. Museum. The Louvre is numerically strongest in Fr. painting, as the National Gallery of London is in Brit. painting; and it has finer examples of every Fr. painter. Neither the Louvre nor the National Gallery (London) gives any adequate representation of the art of the other country. Similarly in the Prado, the Sp. school, from Coello to Goya; in Florence and Venice, the various It. schools; and in Belgium and Holland the Flemings and Dutch artists are all accorded by far the most space. Yet everywhere in Europe, excepting in the galleries of the Low Countries, and Italy (with the exception of two relatively small rooms in the Uffizi palace), there is no actual lack of foreign paintings. The Dutch paintings in the Louvre, as in the National Gallery of London, and also the few in the Uffizi gallery, are among the finest examples, and indeed the same may be said of those in Vienna, Munich, and Dresden. Generally speaking, there are not many fine examples of the Brit. school to be seen in the great public continental collections. The Eng. collection in the Louvre, however, if not large is at least representative: Reynolds, Romney, Raeburn, Lawrence, Hoppner, Boulneton, Constable, Turner, and Wilson. Among the pictures of old masters in the Louvre are works of the It., Flemish, Sp., and Dutch schools. Among the notable It. pictures are the following: Leonardo, 'The Virgin of the Rocks,' 'John the Baptist in the Wilderness,' and the world-famous 'Mona (Monna) Lisa'; Raphael, 'Holy Family,' portrait of Baldassar Castiglione, one of the finest portraits in the Louvre, 'The Madonna' known as 'La Belle Jardinière,' and 'Jeanne d'Aragon'; Sebastian del Piombo, 'Holy Family'; Titian, 'Vierge au lapin,' 'Entombment,' 'Antiope,' 'L'Homme au

Gant'—one of the glories of the Louvre; Correggio, 'Mystical Marriage of St. Catherine'; Giorgione, 'Concert champêtre'; Tintoretto, 'Susanna in the Bath'; and Paul Veronese, 'Feast in the House of Simon.' Dutch and Flemish pictures include Rembrandt, 'Venus and Cupid,' 'Tobit,' and 'Pilgrims at Emmaus'—one of the great treasures of the Louvre; Van Eyck, 'Vierge au Donateur'; Frans Hals, 'Bohémiennes'; Jordaan, 'Christ expelling the Moneychangers'; Vermeer, 'La Deutellière'; Ter Borch, 'Concert'; and Rubens, landscapes. Also represented among old masters in the Louvre by fine examples are van Goyen, Holbein, Dürer, Paul Potter, Wouwerman, Jan Steen, Luijnen, Rogier van der Weyden, Memling, and Dirk Bouts. Old masters of the Sp. school are represented by Murillo's 'Immaculate Conception of the Virgin' and 'La Cuisine des Anges,' but most of the greatest paintings by Murillo, as those of Velazquez, are in the Prado. The Fr. pictures in the Louvre range from eccles. paintings of the fifteenth century and the great classical painters of the eighteenth century—notably Poussin and Claude to the Chauchoir, Schlichting, Thomy-Thiéret, Moreau-Nélaton, and Camondo collections. Among the glories of the Louvre are Nicolas Poussin's 'Inspiration of a Poet,' 'The shepherds of Arcady,' and 'The Funeral of Phocion.' Masterpieces by Claude include 'Marriage of Isaac and Rebecca' and 'Embarkation of the Queen of Sheba.' In their chronological order the next artists represented are Grenze, Boucher, 'Diana leaving the Bath'; Fragonard, 'Veu à l'amour,' 'Etude,' and 'La Chemise enlevée'; Delacroix, 'The Fight at the Barricades in 1830'; Ingres; Corot, 'Fille à sa toilette,' 'La Fille à la perle,' and 'Danse des nymphes'; Millet; Rigaud; Lancret; Watteau; Mauet (portrait of his wife on a sofa); Daumier; and Toulouse-Lautrec. In the Chauchoir collection are Corot's 'Le Moulin,' Millet's 'La Tricotuse' and 'La Bergère,' Meissonier's 'Retreat from Moscow,' and Henner's 'Magdalene Reading in a Cave.' Boucher's brilliant if audacious 'Odalisque' is in the Schlichting collection, as also a portrait of the Pompadour. In the Thomy-Thiéret collection Corots are in abundance, notably 'Entrée de village,' 'Le Vallon,' and 'Le Chemin de Sévres'; also Daubigny's 'Le Marais'; Millet's 'Les Botteurs' and 'Précaution maternelle'; Rousseau's 'La Plaine des Pyrénées,' 'L'Etang,' 'Bords de la Loire,' and especially 'Le Printemps.' In the Moreau-Nélaton collection are other Corots; Manet's famous 'Picnic'; and, in the Camondo collection works of the impressionist landscape school of Monet and Sisley; but the most striking works in this collection are those of Degas, notably his 'Absinthe Drinkers,' and Cézanne's 'Maison du Pendu.' The Luxembourg gallery, in Paris, is devoted entirely to Fr. paintings, its foreign collections having been removed to the Jeu de Paume at the corner of the Place de la Concorde and the rue de Rivoli. In the Luxembourg

are the following especially noteworthy paintings: Monet's 'Yacht Race,' Bouguereau's 'Port of Bordeaux,' Sisley's 'Cour de ferme,' portraits by Carolus-Duran and Fantin-Latour, Chabas's 'Au Crémoule'; and pictures by Valloton, Puvis de Chavannes, Ribot, Cottet, and Gervex. In one room are a famous landscape by Bastien-Lepage, fine examples of the work of Degas, and pictures by such moderns as Matisse and Gauguin. Many of the painters represented at the Luxembourg are also represented in the Petit Palais, which is where the city of Paris houses its, statuary and paintings. The more modern Fr. school is represented by Alphand, Charlot, Chartreuil, Maurice Denis, Laprade, Lepère, and others. The pictures in the Jeu de Paume are not particularly representative; the Sp. section, however, has pictures by Zuloaga; and in the Eng. are pictures by Sir Wm. Nicholson, James Pryde, Watts, Sargent, Winslow Homer, and Orpen.

If the Prado owes much to Charles V. and Philip II., it was Philip IV. who gave the gallery its distinctive character, for it was he who at an early age attached Velazquez, then a young artist of Seville, to his person and, in fact, for the rest of their joint lives allowed affairs of state and even family to be postponed to the interests of art. There are some sixty of the paintings of Velazquez in the Prado and they include nearly all of his masterpieces, and no other gallery has any of Velazquez's paintings that can compare with his 'Los Meninas' (impressionist), 'The Tapestry Weavers,' 'The Surrender of Breda,' 'Los Borrachos' (i.e. The Topers), and 'Esop,' and other portraits. The next great Sp. painter represented here is Murillo, but there are also many fine works by him in other N. G. outside Spain. Among his best in the Prado are a picture of the Holy Family known as 'The Little Bird' and 'Los Niños de la Concha'—representing the children Jesus and St. John playing together with a lamb. There are here hundreds of Goya's paintings—numerous lifelike portraits, his popular 'Maja' and its fellow portrait of a Sp. girl on a couch, and also scenes of the Fr. invasion of 1808. To the above three great Sp. national artists must be added El Greco (Domenico Theotocopuli), Zurbaran, and Ribera; and together these six artists' works make the Prado a gallery apart. There are, however, here some of the finest works of Titian, Rubens, and Van Dyck—notably Titian's 'La Fecundidad' (a number of cherubs), and his portrait of Charles V. Also among the foreign paintings are a splendid 'Conception' by Tintoretto, Raphael's portrait of Cardinal Riario, Van Dyck's 'Countess of Oxford,' and a number of early Flem. works.

The Uffizi and Pitti palaces of Florence contain two of the greatest collections of pictures in the world. Lorenzo the Magnificent was the virtual founder of the Uffizi, though it was left to Francis I., Ferdinand II., and Cosimo III. to make the collections what they are to-day. The Uffizi gallery takes its name from the Palazzo degli Uffizi, or Palace of the

Offices, where the municipal gov. was carried on. The special pictorial treasures of the Uffizi, after the examples of paintings at the earliest, from Cimabue, through Giotto, to Fra Angelico, are the 'Holy Family' of Michelangelo; the 'Adoration of the Magi' by Leonardo da Vinci (unfinished); the 'Baptism of Christ' by Verrocchio; many paintings by Botticelli; Piero della Francesca's portraits of the duke and duchess of Urbino; and many famous paintings by Raphael, Titian, Giovanni Bellini, and Hugo van der Goes (a foreigner). Botticelli's paintings include the 'Primavera,' 'The Calumny of Apelles' (painted as a tribute to Savonarola), 'Judith and Holofernes,' 'Pallas and Mercurius,' 'The Birth of Venus,' and the 'Madonna of the Magnificat' depicting the boy Lorenzo and his brother Giuliano. Other popular favourites are Fra Lippo Lippi's 'Madonna and two Children'; Raphael's 'Madonna of the Goldfinch'; and scenes in the life of Christ by Honthorst (a foreign painter). Also must be mentioned Luca Signorelli's 'Madonna and Child,' Bronzino's portraits of the later Medici, Correggio's 'The Repose in Egypt,' Titian's 'Madonna of the Roses,' Bellini's 'Sacra Conversazione,' and a wealth of other paintings by Titian, Bellini, and Giorgione which afford unrivalled opportunities to study the work of these artists in the Venetian room at the Uffizi where they are concentrated. Among foreign works here are paintings by Rogier van der Weyden, Memling, Rubens, Van Dyck, and Jordaens; while the Ger. school is represented by Cranach and Durer. Like the Uffizi collections that of the palace of Luca Pitti was formed by members of the Medici family. The Uffizi collections represent all It. art but with special emphasis on Tuscan. The Pitti paintings, on the other hand, belong much to one period, the mature period of It. art, when Raphael was dominant. Here are Raphael's 'Madonna del Granduca' (the Grand Duke Ferdinand III.) and the 'Madonna della Sedia' (both known everywhere through coloured reproductions), and also the same master's 'La Donna Velata' or 'The Fornarina' (baker's daughter and the artist's betrothed), his portrait of Pope Leo X, and his 'Vision of Ezekiel'—all in one gallery of the Pitti. Also famous is Giorgione's 'Concert'—sometimes attributed to Titian. Tintoretto is represented by some fine portraits and Titian's works here include one known as 'The Young Englishman' (said to be the earl of Arundel). Among other artists at their best in the Pitti are Andrea del Sarto, Fra Bartolomeo, whose masterpiece 'The Deposition' is here, and Filippino Lippi. Among foreign artists represented in the Pitti are Van Dyck, Rubens, and Sustermans. The chief of the smaller galleries of Florence are the Accademia and the Museo di San Marco. One of the most popular pictures in the Accademia is Fra Bartolomeo's 'Vision of St. Bernard'; others are Michelangelo's 'David' and the 'Prisoners.' In the Museo di San Marco are notable works by Fra Angelico. The

Vatican frescoes of Raphael are important as exhibiting powers far from exhausted in the painting of Madonnas; while Rome has also Michelangelo's Sistine ceiling and the 'Last Judgment'—an astounding feat of decoration. Among the paintings in the Vatican as distinct from frescoes are Raphael's 'Coronation of the Virgin' and works by Fra Angelico and Sano di Pietro. Two pictures in the Villa Borghese enrich further Rome's art treasures: Correggio's 'Danae' and Titian's 'Sacred and Profane Love.' Here too are Domenichino's 'Chase of Diana'—a popular favourite—and a scene by Paolo Veronese. The school of Lombardy is conspicuous in the Brera collection of Milan, the chief treasures of which gallery are Venetian, such as the 'Finding of the Body of St. Mark' by Tintoretto and a 'Pieta' by Giovanni Bellini. Also must be mentioned Raphael's 'Espousals of the Virgin,' portraits by Cima and Lotto, and Luini's 'Madonna in a Bower of Roses.' Milan's other great gallery, the Ambrosiana, is made glorious by its examples of drawings by Leonardo and by the original cartoon for Raphael's 'School of Athens' fresco in the Vatican.

The central gallery of Venice is the Accademia on the Campo di Carità. In it may be studied the whole sequence of Venetian art from the fourteenth century onwards, from Lorenzo Veneziano to the Bellinis to Carpaccio and Cima and so to the great period of Titian, Giorgione, Tintoretto, Palma Vecchio, Lotto, Paris Bordone, and down to Tiepolo. One of the outstanding possessions of the Accademia is the splendid series of paintings by Carpaccio on the legend of St. Ursula. Next to these may be seen the series of Giovanni Bellini's Madonnas, one of them, 'Madonna with the Magdalene and St. Catherine' being equal to his work in the National Gallery of London. The finest of Titian's paintings here is his 'Presentation of the Virgin.' Two other great treasures are the dramatic 'Miracle of St. Mark' of Tintoretto and the splendid composition, 'The Feast in the House of Levi,' by Paul Veronese. With Tiepolo the greater days were past, but much excellent work is to be seen in the water-pieces of Canaletto and Guardi.

The nucleus of the Viennese gallery in the Art-Hist. Museum in Maria Theresa Platz was formed by Ferdinand I., brother of Charles V. of Spain, who succeeded the latter as emperor of the Holy Rom. Empire. The artists of all nations are well represented here. In the early Dutch masters the gallery is rich, particularly the work of Joost van Cleve, Mabuse, Jacob Cornelisz, Jan van Eyck, Memling, and Hugo van der Goes. Here also are paintings by Ter Borch, Jan van der Capelle, Brouwer, Van Goyen, Ruisdael, Jan Steen, Van den Hoekker, Pieter de Hooch, and Rembrandt—the latter is represented by no fewer than eight pictures, including that of his son Titus. There is a famous series of pictures by Brueghel, the best of his work in any gallery, not excluding even Belgian galleries. Other great Flem. painters represented are Rubens with his

immense 'Festival of Venus,' 'St. Ambrose and the Emperor Theodosius,' and 'Ignatius casting out Devils'; Van Dyck, and Jordaeus with 'The Drunken King,' a variant of a similar theme in the Louvre. The wonderfully elaborate 'Trinity' of Durer is one of the outstanding works in Vienna and also here are his 'Young Venetian Woman' and a 'Madonna and Child.' Other Ger. masters follow, including Holbein with portraits of Jane Seymour and John Chambers. Eng. artists are especially represented by Hogarth, Reynolds, and Gainsborough (with a landscape). The Viennese gallery is strong in Venetian and other It. schools. Here are Titian's most dramatic picture, 'Ecce Homo,' some of his finest portraits, and his 'Child with the Tambourine.' Other earlier Its. represented here are Tintoretto with his portrait of the admiral, Sebastiano Veniero; Palma Vecchio; Paris Bordone, and Giorgione, with his unforgettable 'Three Magi.' Among the works of later It. artists are the pagan and voluptuous 'Io' and 'Ganymede' of Correggio; Parma's 'Paradiso' (Parma); 'Cupid shaping his Bow'; Raphael's 'Madonna al Verde'; Fra Bartolommeo's 'Presentation in the Temple.' Also in Vienna is the Liechtenstein collection, which is notable for its pictures by Rubens and Van Dyck alone. Here are the latter's beautiful portrait of a woman 'Marie Louise von Tass' and Rubens's portrait of his two sons.

The Old Pinakothek of Munich was built for a picture gallery early in the nineteenth century by Ludwig I, and its pictures are chiefly of royal descent, but the true patron of this gallery was Maximilian II. Emanuel (1679-1726) who bought numerous pictures, especially by the Flem. artists, when he was stadtholder of the Low Countries, and he also built a new castle in which to house his pictures. Later the Elector Palatine, Charles Theodore, transferred to Munich the Mannheim collection formed by the Elector Charles Philip; while his successor Maximilian IV. added 2000 pictures of the Zweibrücken collection. In 1795 the Fr. under Moreau entered Munich and pillaged the galleries, though some of the stolen works were returned after 1815. Previously (1805) the famous Dusseldorf academy collection, founded by Maximilian III. Joseph, was transferred to Munich. Ludwig I. not only built the present gallery but added a fine collection of altar-pieces. Like the Louvre and the Viennese gallery, the Munich gallery is divided into large rooms and cabinets, a continental custom which tends to obscure the true wealth of a collection, besides dispersing the pictures in such fashion as to make it harder to study each school in turn. The Munich gallery is, naturally, strong in the works of the early Ger., and also in the later Ger. masters, such as Altdorfer, Hans Baldung Grün, and Schongauer. Among the great Flem. artists examples of whose best work may be seen here are Rogier van der Weyden, Dirk Bouts, Memling, Gerard David, and, above all, Rubens, who is represented here

by the most varied paintings—from the immense 'Last Judgment' to the 'Drunken Silenus' and 'Landscape with Rainbow,' besides portraits of himself and his first wife. Here too is Jordaeus's 'The Satyr in the Peasant's Home' illustrating Esop's fable, and Van Dyck's popular 'Rest in the Flight to Egypt.' Among outstanding pictures of the Dutch school are Rembrandt's 'Abraham and Isaac' and 'Descent from the Cross'; Hals's 'Fish Girl,' and a seascape by Cuyp. The Munich gallery, however, is relatively poor in examples of the It. schools though there are paintings of the Holy Family by Raphael, Andrea del Sarto, and also Perugino's 'The Virgin appearing to St. Bernard.' Titian is, however, well represented by a beautiful 'Madonna and Child' and a portrait of Charles V. of Spain. Other outstanding pictures are Goya's portrait of Luisa, queen of Spain, Poussin's 'Apollo and Daphne' and 'Bewailing Christ,' and the rare series of tavern pictures of Adriaen Brouwer.

The foundations of the Dresden Gallery collection were laid by Augustus I. in the sixteenth century and by Francis III., duke of Modena, who purchased Raphael's 'Sistine Madonna' from the Benedictines of San Sisto. This is commonly regarded as the supreme treasure of the collection, but other and equally outstanding pictures are Titian's 'Christ and the Tribune Money,' 'Madonna and Child with Saints,' and 'The Man with a Palm'; Correggio's 'Holy Night'—remarkable for its lovely irradiating light effect; Lotto's 'Madonna with Christ and St. John'; the Swiss painter Liotard's 'Chocolate Girl'; Rembrandt's 'Saskia with a Pink' (i.e. Saskia van Uylenborch (Uylenburgh), a Frisian girl whom Rembrandt married in 1634 and who d. in 1642), and 'Monaah'; Holbein's portrait of the Sieur de Morette; Vermeer's 'Young Courtesan'; and Giorgione's 'Sleeping Venus'—supposed to have been left unfinished and completed by Titian. There are also many works by Lucas Cranach and a self-portrait and other works by Durer. The Dutch collection is also famous—works by Hals, De Brey, Brouwer, Adriaen van de Velde, the two Ruisdaels, Van Goyen, and many others not quite so well known.

The Kaiser Friedrich Museum, in Berlin, was named after the Emperor Frederick III. —the nucleus of its paintings being the Giulini collection bought in France in the early nineteenth century and some hundreds of works collected by Edward Solly, an Eng. trader resident in Berlin in the same period. The finest masterpieces in the collection are the radiant 'Daniel's Vision' by Rembrandt; Van Dyck's portrait of the Marchesa Geromina Spinola; Vermeer's 'Pearl Necklace'; Holbein's portrait of George Giese; Giovanni Bellini's 'Christ Risen'; Zurbaran's 'Group of Theologians'; Signorelli's 'Pain'; Dürer's 'Young Woman'; and Frans Hals's 'Little Bobbie' and 'Mother and Child.' While this collection is unquestionably universal in range, it is, naturally, very strong in the Ger. school from the early masters to the mature era

of Dürer and his contemporaries. Among Ger. artists represented here besides those mentioned, are Altdorfer, Breu, and Adrian Richter. Rubens is particularly well represented, notably by his 'Perseus and Andromeda,' and 'St. Cecilia.' Other Low Country masters with notable works here are Ter Borch, with 'Concert'; Pieter de Hooch, and Koninck, with a 'Landscape.'

The Antwerp Museum of Fine Arts was built in 1890 to house the Rubens and Van Dyck collections consisting of paintings from suppressed religious foundations and churches, from the Steen Museum, and from the tn. hall, together with numerous engravings and photographs. Like the Palais des Beaux-Arts in Brussels, the Antwerp Museum is rich in pictures by Van Eyck and Rogier van der Weyden, in their early period, as well as in paintings of the great florid period of Rubens's art. Notable among the paintings here are Van Eyck's 'St. Barbara' painted as far back as 1437, and his almost equally old 'Madonna of the Fountain,' and Van der Weyden's 'Seven Sacraments.' But pride of place is naturally given here to Rubens and Van Dyck, both men of Antwerp—as indeed was also Jacob Jordaens, who is also well represented here, notably by his 'Family Concert' and boldly imaginative 'Last Supper.' Among the Antwerp Museum's outstanding examples of Rubens's prolific art are the triptych of St. Thomas with contemporary portraits of the donors in the wings and the 'Descent from the Cross'—regarded as the masterpiece of the gallery—the huge 'Adoration of the Kings,' and 'Christ Crucified between Two Thieves.' In a different mood is his 'Venus Frigida.' There are of course many portraits by Van Dyck, who was largely a portrait painter. Here are his portraits of the Eng. Charles II, as a child and of Hélène Fourment. Other notable pictures here are Memling's famous 'Heavenly Choir,' the 'Salome' of Quintin Matsys, Cornelis de Vos's portrait of the old 'Guildsman,' Jan Steen's 'Dutch Wedding Feast,' and pictures by Brueghel, Brouwer, Coques, Abel Grimmer, Hals, Hobbema, De Hooch, Koedijck, Rembrandt, Schalcken, Ter Borch, Van de Capelle, Van Goyen, De Vries, and Vermeer.

Among outstanding Flem. masters, pictures, apart from the works of Rubens, in the Palais des Beaux-Arts, Brussels, are Memling's 'Martyrdom of St. Sebastian'; a 'Virgin and Child' by Gerard David; an 'Annunciation' attributed to 'the maître de Flémalle' (Robert Campin); and a beautiful 'Holy Family' by Hugo van der Goes. Rubens, however, outshines all others here, the prime favourite being his great 'Adoration.' Other great pictures of his are the 'Assumption of the Virgin' and 'Venus at the Forge.' Also here are a number of his sketches for paintings. The Brussels Van Dycks include representations of St. Francis of Assisi and St. Anthony of Padua. Among the finest paintings by Jordaens are his 'Pan and Syrinx' and 'The Drinking King.' Here too are works by Nicholas

Maes, a rare painter outside Holland, and the 'Weaver's Repose' by Ostade; 'The Gift' (a landscape) by Wynants; and pictures by the old Brueghels (and others assigned to the various Brueghels), Snyder, Cornelis de Vos, Gaspard de Crayer, Ter Borch, and also some pictures by the Eng. school—Reynolds, Raeburn, Constable, and Lawrence.

The great gallery of the state museum in Amsterdam is devoted to indigenous works. The nucleus of the collection consisted of pictures belonging to the House of Orange. Other and later acquisitions were the collections of Adriaen van der Hoop and Baron van der Poll acquired in 1880 and collections from the various guild houses. All the Dutch masters are represented here in abundance, although a few of their great works may have been exported. It is generally held that Rembrandt's somewhat misnamed 'Night Watch' is the *pièce de résistance*. It was painted in 1642 and is the master's largest picture. Other favourites of Rembrandt here are 'Synetics'—a group of Dutch merchants in conference—and the 'Jewish Bride.' There are sev. of the choicest paintings of Vermeer, among them being 'Maid servant Pouring Milk,' his very popular 'The Letter'—an elaborate painting of a woman with a mandolin—and 'Little Street.' Mention must be made of 'The Never-ending Prayer' by Maes and the same artist's 'The Spinner'; and also of the Fr. paintings in the modern section of the gallery. There is also a large collection of Van Gogh paintings and drawings, but suspicion has recently been cast by experts on their genuineness.

The Mauritshuis at The Hague dates from the 1630's when it was the residence of Count John Maurice of Nassau, but the building only became a gallery in 1821 when it was used to house the remainder of various collections of the princes of Orange which had survived the vicissitudes of war. Here again, as at Amsterdam, the outstanding work is by Rembrandt, namely his sombre and dignified 'The School of Anatomy'; and hardly less famous are his 'Susanna Bathing,' 'Simeon in the Temple'—a miracle of composition and light—and 'David Playing the Harp before Saul.' Yet equally popular are Jan Vermeer's 'View of Delft' and 'Head of a Young Girl,' and Paul Potter's 'Bull'—great in scope and treatment. Other well-known pictures here are the genre study, 'Young Housekeeper,' by Gerard Dou, a pupil of Rembrandt, and a view of Haarlem by Jacob Ruysdael, 'The Oyster Feast' by Jan Steen, and also a number of pictures by Ostade, Ter Borch, Wouwerman, and others. Among the few works of foreigners are portraits of his two wives, Isabella Brant and Hélène Fourment by Rubens and works by Holbein, Van Dyck, and Velazquez. Hero may be mentioned the Haarlem Museum Gallery which is largely a Frans Hals memorial. There are in it, however, some very fine landscapes by Vermeer, portrait groups by Ter Borch, and paintings by Van der Heist and Brouwer.

United States Galleries.—There are seven galleries of paintings in the various great art museums of the U.S.A.; but the National Collection of Fine Arts, occupying the central hall of the natural history museum of the Smithsonian Institution (Tenth Street, Constitution Avenue, Washington, Dist. of Columbia) and the National Gallery of Art, formed through the gifts of the late Andrew Mellon (which is at Constitution Avenue, Madison Drive, 4-7th Street, Washington, and comes under the administration of the Smithsonian Institution), together constitute what may be regarded as the N. G. of the U.S.A. Little was done in art in the Smithsonian Institution until Harriet Lane Johnston bequeathed her collection to the Corcoran Gallery of Art to hold until the forming of a national gallery of art. The decision of the supreme court of the dist. of Columbia in 1906 estab. the fact that the Smithsonian Institution was already the National Gallery of Art. The collection was then delivered. It consisted of paintings by Beechey, Constable, Hopper, Lawrence, Romney, Reynolds, Lulini, and others. About the same time Charles L. Freer of Detroit gave his extensive art collection, including among paintings work by Chinese and Jap. artists and a large collection of Near E. paintings, and also representative examples of the work of Amer. painters, Whistler being extensively represented. The next gifts of importance were the collection of twenty-four old masters given by Ralph Cross Johnson, including works by Coques, Flinck, Francke, Gainsborough, Guardi, Hogarth, Lawrence, Lotto, Macs, Manhardt, Van Orley, Rubens, Rembrandt, Romney, Rubens, Titian, Turner, and Wilson; and in 1907 Wm. T. Evans inaugurated his gift of paintings by contemporary Amer. artists, which by 1916 numbered 151 paintings by 107 artists. In 1929 John Gellatly gave his collection, which included 112 paintings by 44 Amer. artists and 22 by European artists, including Gonzales, Guardi, Puvis de Chavannes, Rubens, Tiepolo, and Van Dyck. In 1935 came the announcement of the plans of Andrew W. Mellon to present to the gov. his great collection of paintings and also to furnish funds with which to erect at Washington a building, to be called the National Gallery of Art, or a similar name. The completion of these plans was expected to place the U.S.A. upon an equality with other nations in regard to great art possessions. The building under the Mellon fund was completed in 1940 and is known as the National Gallery of Art, the former National Gallery of Art of the Smithsonian Institution being now known as the National Collection of Fine Arts. The latter collection, besides the works mentioned above, contains a number of works by contemporary Fr. artists. The permanent collection in the N. G. formed under the Mellon fund includes the Mellon collection of 126 paintings, chiefly of the It., Flem., Dutch, Eng., and Amer. schools, and 24 pieces of sculpture of the It. Renaissance, as well as the Kress col-

lection of 375 paintings, 18 pieces of sculpture, and 400 Amer. prints.

Famous painters of all countries are well represented in the Boston Museum of Fine Arts, among the most notable being Fra Angelico, Rogier van der Weyden, Florenzo di Lorenzo ('Madonna and Child and St. Jerome'), Piero della Francesca ('Madonna and Child'), Andrea Mantegna, Velazquez ('Don Baltazar and his Dwarf') and 'Infanta Maria Theresa'), El Greco ('Fray Felix Hortensio'), J. M. W. Turner ('The Falls of the Rhine at Schaffhausen' and 'The Slave Ship'), Manet ('Kneeling Monk'), Gauguin, and Van Gogh ('The Postman Roulin'). The paintings in the Fogg Art Museum (Harvard Univ.), which was founded by a bequest of Mrs. Elizabeth Fogg, 1891, include many by It. masters —Fra Angelico, Ghirlandaio, Botticelli, Simeone Martini, Giovanni di Paolo, Girolamo di Benvenuto, and Cosimo Tura, and, of the Sp. school, paintings by Luis Borrassa, Ribera and Murillo, and, of the Fr., paintings by Cézanne, Monet, Renoir, Degas, Forain, Manet and Toulouse-Lautrec; and also paintings by Copley, Gainsborough, and Van Dyck. The Art Institute of Chicago has a collection of over 1000 paintings—including Fr., Dutch, Flemish, It., and Amer., together with prints and drawings by Rembrandt, Whistler, Meryon, Toulouse-Lautrec, Zorn, Bredin, and others. The Cincinnati Art Museum has paintings by Mantegna ('Tarquin and the Cumæan Sibyl'), Lucas Cranach the elder ('St. Helena'), Bernardino Luini, Lorenzo di Credi, Bronzino, Frans Hals ('A Dutch Family'), Rembrandt, Van Dyck ('John, Count of Nassau'), Gerard Ter Borch ('A Music Party'), El Greco, Murillo, Gainsborough ('Viscount Downe'), and a large group of Turner and Whistler prints. In the Wm. Rockhill Nelson Gallery of Art, Kansas City (opened in 1933) are paintings by Titian, Veronese, Rubens, Goya, Rembrandt, Caravaggio, Tiepolo, El Greco, Hobbema, Poussin, Claude, Robert, Millet, Van Gogh, Ingres, Tintoretto, and Joos van Cleve. In the Carnegie Institute, Pittsburgh, founded in 1896, considerable interest is shown in contemporary Amer. paintings, and an international exhibition of paintings is held here annually. The permanent exhibits of the City Art Museum, St. Louis (reorganised 1909) include European and Amer. paintings —among them El Greco's 'St. Paul'. See W. Monkhousen, *In the National Gallery*, 1898; Sir E. Poynter, *The National Gallery* (3 vols.), 1900-1; Julia Addison, *Art of the National Gallery*, 1905; S. Diek, *Hours in the National Gallery*, 1925; C. Bell, *Enjoying Pictures*, 1934; and Sir K. Clarke, *One Hundred Details from Pictures in the National Gallery* (presenting a hundred almost unknown works to the public) 1938.

National Geographic Society, formed in 1888, in the U.S.A., by Gardiner Greene Hubbard, who held the presidency until his death in 1897. His successor was Alexander Bell, inventor of the telephone. Existing for the 'increase and diffusion of

geographic knowledge,' the N. G. S., in collaboration with the gov., and other public bodies, has sponsored many expeditions. Amongst them, were the Peary expedition to the N. Pole, the Byrd expeditions to the N. and S. Poles, and the Beebe expedition of 1934, 'man's deepest plunge' into the Atlantic, as well as expeditions into Peru, China, and New Mexico. The society's maps were extensively used by Brit. and Amer. military and naval authorities during the Second World War. In 1899 the N. G. Magazine was produced under the editorship of Gilbert Grosvenor, who still holds the post as well as the presidency of the society. It has a monthly circulation of over 1,800,000, one-tenth of it in the Brit. Commonwealth. Lord Bryce, Lord Halifax, and Sir Wilfred Grenfell have been amongst the Brit. contributors.

National Government (Great Britain). name given to the gov. which replaced the second Labour Gov. in Aug. 1931, and which was made up of ministers drawn from all three political parties, with Ramsay MacDonald as Premier. The resignation of the Labour Gov. followed their inability to concur in measures to meet the threatened financial crisis, a saving of some £120,000,000 being required to balance the budget of 1930-1931. The N. G. was formed to carry out a policy of retrenchment of expenditure so as not only to provide for the needs of the budget, but also to restore foreign confidence in the financial stability of Great Britain. The Cabinet comprised ten members—four Conservatives (Stanley Baldwin, Neville Chamberlain, Sir Samuel Hoare, and Sir Philip Cunliffe-Lister), four Labour (Ramsay MacDonald, Lord Sankey, Philip Snowden, and J. H. Thomas), and two Liberals (Earl Reading and Sir Herbert Samuel). Arthur Henderson, who had been foreign secretary in the Labour Gov., became leader of the Opposition. The newly formed Cabinet was to continue in office until means were provided to balance the budget and the crisis passed, when a general election would take place. With the aid of Conservative and Liberal votes, the N. G. passed the second budget. Economies were effected by increased taxation; the standard rate of income tax rising to five shillings. Surtax was increased by 10 per cent and extra taxes imposed on beer, tobacco, petrol, and entertainments. Further economies were effected by the reduction of civil service pay and the pay of the forces, police, and teachers, etc., by cutting down unemployment pay (the 'dole') by 10 per cent. A temporary impetus was also given to the export trade by the abandonment of the gold standard. Confidence at home and abroad having thus been restored by the saving of the pound, the N. G. appealed to the nation, asking for a 'doctor's mandate' to do whatever was necessary to secure financial and economic stability. The N. G. obtained the record majority of nearly 500—the Labour opposition being almost wiped out. The actual figures were: N. G.: Conservatives, 471; National

Liberals (followers of Sir John Simon and Sir Herbert Samuel), 68; National Labour, 13; National Independent, 3; total 554; Opposition: Labour (Socialist) 52; Liberals (followers of Lloyd George) 7; Independent, 2; total 61. (The Communists secured no seats.) The gov. was, in effect, a Conservative Gov. In Nov. 1935, a second so-called 'N.' G. was returned. Out of its 454 seats the Conservative party retained 385, thus obtaining a clear majority over all other parties combined. The 'National Liberals,' whose policy thenceforward became indistinguishable from that of the Conservatives, obtained 32 seats, and 'National Labour,' party with no future, only 8 seats. The Liberals came back only 17 strong instead of 26, and the Independent Liberals 4 instead of 6. The Labour party increased its representation by 95 seats to 154, while the Independent Labour party secured 4 and the Communists 1 seat. The total Opposition thus amounted to 184. The N. G.'s success at the polls was remarkable in view of the fact that it had no constructive policy; but apparently the country was content to endorse a programme which, mainly concerned with foreign affairs, contemplated the League of Nations as the corner-stone of Brit. foreign policy and the adoption of a firm line in the Italo-Ethiopian dispute—which latter was not adhered to. Early in 1939 there was a general expectation in political circles, that, barring the outbreak of war, there would be another election, the issue being foreign policy, with rising popular disaffection over 'appeasement.' The outbreak of war, however, imposed a truce on party conflict and the N. G. remained in office; but, in 1940, the gov. was reconstituted under Winston Churchill as a Coalition Gov. including a number of leading Labour and Liberal members. Every shade of political opinion was thus represented in the National Ministry, but criticism of the conduct of the war was freely voiced in Parliament by recognised gov. supporters as well as by former political opponents, and gov. by Parliament as a whole might almost be said to have taken the place of gov. by party. See also MACDONALD, JAMES RAMSAY; POLITICAL PARTIES; SNOWDEN, PHILIP.

National Grid. Brit. system of map-referencing instituted after a recommendation by the Davidson Departmental Committee of 1935-38. From the central meridian are laid out squares with sides at right angles and parallel to it respectively, and which are multiples of the international metre. Thus there can be found for every point a map-reference peculiar to itself consisting of the rectangular co-ordinates of the point measured eastwards and northwards. The Full Kilometre reference consists of two figures showing the square with 100 km. sides followed by two pairs showing the square with 1 km. side, e.g. 41/2668. The initial point from which measurements are made has been arbitrarily fixed at a point to the S.W. of the Scilly Isles. The scale of the

map does not affect the reference, though since with the larger scales more digits can be included, greater accuracy is thereby achieved. A sheet line system related to the grid links the various scales by allowing the smaller to be used as indexes to the larger. The N. G. system has proved of very great value in many fields of activity: in local gov., for keeping records and statistics, for describing sites, for police work, and so on. The War Office is in the process of replacing their military grid by the N. G.

National Guard, name given to an armed force of citizens organised for local defence. The term is applied particularly to the Fr. *garde bourgeoise*, which was enrolled at the time of the revolution. The National Assembly proclaimed in 1790 the principle of compulsory and universal service, to which all qualified citizens belonged, and membership of which was in most cases a necessary corollary of the full rights of citizenship. The N. G. was not abolished until 1872. Local forces in Spain, Italy, etc., and organised militia in all parts of the U.S.A., are also called N. Gs. See UNITED STATES. Army.

National Health Service Act (1946) gives legislative form to the State scheme for promoting a comp. health service in England and Wales (there is a similar Act for Scotland), which was evolved from the proposals made by the wartime Coaliton Gov. as pub. in a White Paper in Feb. 1944. The main services include: (i.) *Health Centres and Family Doctor Service*.—Personal health service and treatment by doctors and dentists, whom the patient chooses, are available at health centres, at home, or at the doctor's own surgery. Doctors may choose whether or not to join the service and joining it does not debar them from receiving fees from patients who do not wish to take advantage of the state scheme, which is available to every one, free and without qualification or limitation. (ii.) *Hospital and Consultant Service*.—All forms of general and specialist hospital care and treatment, both in-patient, and out-patient, are included. Specialist opinions and treatment of all kinds are available at hospitals, institutions, clinics, and also at health centres and in the patient's home. The minister of health is responsible for this service, which is administered by regional boards. The existing premises and equipment of voluntary and public hospitals are transferred to the minister, and he is empowered also to acquire, by purchase, if necessary, other hospitals and their equipment, which may be required for the service. The endowments of voluntary teaching hospitals are given special treatment under new boards of governors. Both types of board are free to receive gifts or legacies (see further under HOSPITALS). (iii.) *Supplementary Services*.—These include midwifery, maternity and child welfare, home nursing, a priority dental service for children and expectant and nursing mothers, and domestic help when needed on health grounds. These

services are administered by the co. and co. bor. councils, which are known as the local health authorities.

The Act makes provision for the service of family doctors, dentists, and chemists to be organised by local executive councils and based upon the health centre. The members of these councils are to be nominated in equal numbers by the major local authorities and the minister and by the local practitioners. All doctors and dentists contract with the councils, and each doctor has his own list of patients whom he has agreed to attend and may use the health centres in place of surgeries (as also may dentists). The patient's freedom in the choice of doctor is not cancelled by the Act, nor is there a provision for a general direction of doctors. Payment of doctors is by capitation fees. The sale of practices which are wholly or partly within the National Health Service is prohibited, and compensation is payable to present practitioners for loss of selling values. Normally compensation is payable on retirement or death.

There is no legal obligation to register as National Health Service patients, to obtain any of the benefits of the service. All the benefits are available to the private patient, save only the free services of his doctor and the drugs and appliances ordered on the official prescription form. The hospitals, the Medresco hearing aid, the spectacles, dentures, and other things are his if he needs them.

Hospital Staffs.—The staff of all hospitals in the national service will be in the employment of regional boards (or boards of governors of teaching hospitals). Specialists taking part in the service will be attached to the staff of hospitals. Part-time participation in the service does not debar the specialists from continuing any private practice outside the service. The boards will determine the terms of engagement of any staff employed in the hospital service. The minister of health, however, is empowered to make regulations governing the qualifications, conditions of service, and remuneration of any or all classes of hospital staff—as of the staff engaged in any other part of the health service.

'Pay-bed' Accommodation.—Where there are single bedrooms or small wards in hospitals the minister of health is empowered to make them available to patients who wish to secure greater privacy by paying the extra cost; but this is subject to the requirements of patients who need such accommodation on medical grounds, and these will be able to have it without payment. The minister is also empowered to provide separate pay-bedrooms or blocks for which people can pay the whole cost privately and in which part-time specialists within the service can treat private patients. Private patients using the accommodation will pay their own specialist's fees, but the Act enables the minister to prescribe maximum fees which specialists may charge in these circumstances.

Compensation for Loss of Selling-values of Practices.—Doctors who join the public

service at the outset are entitled to compensation in respect of loss incurred through being unable thereafter to sell their practices. Any doctor who dies or retires between the date of the passing of the Act and the appointed day, and whose practice has not been sold in the meantime, is qualified for compensation. The total amount of compensation to be made available to the profession under the Act is a sum of £66,000,000 for England and Wales and Scotland. Provision is made for the total sum to be reduced if the number of practitioners taking part in the service falls substantially short of the expected total. The detailed method of apportioning the total sum among doctors is governed by regulations. The Act contemplates that the settling of the apportionment among the individual doctors shall be left, in the main, to the profession itself. Under an amending Bill of 1949, where one partner not in the service is obliged to buy the share of a partner in the service—which may be of little value to the former—that obligation becomes an option, and the partner in the service is not entitled to be paid compensation out of the fund. But where a partner in the service is obliged to buy the share of a partner outside the service, he will be entitled to compensation from a fund additional to the original compensation fund. There is a further provision that, where one partner in the service sells the goodwill of his practice to another partner in the service, the compensation payable under the Act is substituted for the contract price provided for in the partnership agreement, and becomes payable on the transfer taking place.

Drugs, Medicines, and Appliances.—Those who use the general practitioner service are entitled to the supply, free of charge, of necessary drugs, medicines, and appliances (save for a nominal charge of 1s.). Every properly qualified pharmacist has the right to join the new service. Drugs, etc., required for hospital purposes will be supplied as part of the hospital service.

Dental Service.—Outside the priority arrangements noticed above, the Act provides for a general dental service, in which any dentist may participate, with remuneration by appropriate salaries for the amount of time which they give to the service. Outside the centres it is open to any one to arrange with any dentist in his own surgery, who agrees to undertake his or her dental care. The dentist may subsequently submit a claim for payment from public funds. But for certain forms of treatment the dentist will submit an estimate to the Dental Estimates Board, a new professional body established by the Act (see further under NATIONAL DENTAL SERVICE).

Eye Services.—The care of the eyes, with sight-testing and the supply of spectacles, is carried out in special ophthalmic depts. and clinics forming part of the hospital and specialist service, and also by commercial opticians.

Efficient Service.—The Act provides for setting up a special tribunal to investi-

gate cases where it is claimed, either by executive councils or otherwise, that the continued inclusion of any doctor, chemist, dentist, or optician in the lists drawn up by the executive councils would be prejudicial to the efficiency of the service. The tribunal will have a legal chairman appointed by the Lord Chancellor and will include a member of the same profession as the person whose case is being investigated and one other, the latter two being appointed by the minister of health.

Local Mental Health Services.—The main mental treatment and mental deficiency services are part of the now hospital and specialist arrangements. Local health authorities, however, are given responsibility for all the ordinary local community care in the mental health service.

Vaccination and Immunisation.—Compulsory vaccination is abolished by the Act, but it is the duty of the local health authority to provide free vaccination and diphtheria immunisation.

Ambulance Service.—Apart from vehicles which may need to be provided as part of the hospital service, the provision of main ambulances and hospital transport required for the health service is the duty of the local health authorities, either directly or by arrangement with voluntary organisations. The local health authority's ambulances may, and must, if necessary, operate outside their own area.

Care and After-care of the Sick.—Local health authorities are empowered to make approved arrangements for the prevention of illness and the care and after-care of the sick. This may include the provision of special foods and special accommodation for invalids and convalescents, and the making of grants to voluntary organisations doing work of this kind (but it does not include cash allowances to individuals or families, which is the function of National Insurance). A charge may be made in appropriate cases.

The Act in Operation.—The Act came into force on July 5, 1948. After operation for over a year the costs of the scheme had far exceeded the original estimates; the bulk of the necessary funds were derived from income tax, only a small fraction (less than 1s.) of the weekly insurance contributions being available for health purposes. The services provided had in many ways proved satisfactory and had on the whole been well received by the general public, though many individuals objected to the compulsory nature of the payments. The voluntary hospitals, many of which were prior to the Act in severe financial straits, became independent of charity, but lost some of their autonomy; the provision of hospital beds was still inadequate, especially sanatorium accommodation for tuberculous patients. As regards the remuneration of those providing the services, dentists in private practice earned so much that amounts in excess of £1800 per annum were halved, and their average gross income then far exceeds that of general medical practitioners, who were allowed a maximum of 4000

patients and received a capitation fee in the region of 18s. per patient per annum; it is hoped later to increase this capitation fee to £1 15s for the first 1000 patients on the doctor's list. Medical practitioners in isolated country dists. have a special mileage allowance. Specialist doctors in hospitals were remunerated for services which were previously honorary, though the grading of such doctors was somewhat arbitrary. Private patients were not allowed to receive medicines through the services provided in the Act. Hearing aids for the deaf are to be provided in the future. Many foreign visitors utilised the services, which were available to them without contributions. Statistics produced by the minister of health (Oct. 1949) indicated that the number of persons within the National Health Service was then 41,200,000, or about 85 per cent of the entire pop.; while the number of doctors was between 18,000 and 19,000 out of some 21,000 (statistics do not show how many of these doctors in the service also carry private patients). Prescriptions dispensed in the first year of the service were stated to have numbered 187,000,000 at an average cost of 2s. 9d. each. The ann. expenditure on the health service was, according to the minister, about £300,000,000, or twice the amount originally estimated, due principally to the raising of remuneration above the level at first expected. Regarding optical services, it was officially stated that up to Oct. (1949) 5,250,000 spectacles had been supplied, 3,000,000 were then still on order, and current production was at the rate of 7,000,000 a year. Of deaf aids, some 29,000 were issued during the first year, production being at the rate then of 2000 aids a week. Dental patients

accepted for treatment under the scheme numbered 8,500,000; dentists in service, 9400; hospitals taken over, 2688; hospital beds, 501,738; hospital and midwifery staff, 149,783. See C. Hill and J. Woodcock, *The National Health Service*, 1949, and the extra number of the *Practitioner*, 1949.

National Ideology, see IDEOLOGY.

National Insurance Act (1946), gives legislative form to the all-embracing scheme of social insurance which first took shape in the Beveridge Report of 1942 and was developed in the White Paper pub. in Sept. 1944 (see SOCIAL INSURANCE). The Act provides payment by way of unemployment, sickness, and maternity benefit; retirement pension; widow's benefit; guardian's allowance; and death grant. It repeals all existing enactments relating to unemployment insurance, national health insurance, widows' and orphans' and old age contributory pensions and non-contributory pensions; and it provides for payments towards the cost of the national health service (see NATIONAL HEALTH SERVICE ACT (1946)). The main benefits and grants payable under the Act are:

Sickness and Unemployment: 26s., with 16s. for a dependent and 7s. 6d. for the first child.

Retirement pensions: 26s.

Widows and Orphans: widow's allowance, 36s.; widowed mother's allowance, 33s. 6d.; widow's pension, 26s.; guardian's allowance, 12s.

Maternity allowance: 36s.; attendance allowance, 20s.

Maternity grant: £4.

Death grant for adults: £20.

The main contribution rates are set out in the following tables:

EMPLOYED PERSONS

Description of Employed Person	Weekly Rate of Contribution	
	Initial rate	Permanent rate
	s. d.	s. d.
Men between the ages of 18 and 70 (not including men over the age of 65 who have retired from regular employment):		
Earning remuneration at a weekly rate exceeding 30s.	4 7	4 9
Earning remuneration at a weekly rate of 30s. or less	2 8	2 9
Women between the ages of 18 and 65 (not including women over the age of 60 who have retired from regular employment):		
Earning remuneration at a weekly rate exceeding 30s.	3 7	3 9
Earning remuneration at a weekly rate of 30s. or less	2 2	2 3
Boys under the age of 18	2 8	2 9
Girls under the age of 18	2 2	2 3

For the purpose of this (Part I.) and Part II. (next table) of the First Schedule of the Act a person is deemed to be earning remuneration at a weekly rate of 30s. or less if, but only if, his remuneration does not include the provision of board and lodging by the employer and the rate of the remuneration does not exceed 30s. a week, and to be earning remuneration at a weekly rate exceeding 30s. in any other case.

<i>Description of Employed Person</i>	<i>Weekly Rate of Contribution</i>	
	<i>Initial rate</i>	<i>Permanent rate</i>
Men over the age of 18:		
Earning remuneration at a weekly rate exceeding 30s. or not being liable to pay a contribution as an employed person	3 10	4 0
Earning remuneration at a weekly rate of 30s. or less and being liable to pay a contribution as an employed person	5 9	6 0
Women over the age of 18:		
Earning remuneration at a weekly rate exceeding 30s. or not being liable to pay a contribution as an employed person	3 0	3 2
Earning remuneration at a weekly rate of 30s. or less and being liable to pay a contribution as an employed person	4 5	4 8
Boys under the age of 18	2 3	2 4
Girls under the age of 18	1 9	1 10

SELF-EMPLOYED PERSONS

<i>Description of Self-employed Person</i>	<i>Weekly Rate of Contribution</i>	
	<i>Initial rate</i>	<i>Permanent rate</i>
Men between the ages of 18 and 70 (not including men over the age of 65 who have retired from regular employment)	s. d.	s. d.
6 2	6 6	
Women between the ages of 18 and 65 (not including women over the age of 60 who have retired from regular employment)	s. d.	s. d.
5 1	5 5	
Boys under the age of 18	3 7	3 9
Girls under the age of 18	3 1	3 3

NON-EMPLOYED PERSONS

<i>Description of Non-employed Person</i>	<i>Weekly Rate of Contribution</i>	
	<i>Initial rate</i>	<i>Permanent rate</i>
Men between the ages of 18 and 65	s. d.	s. d.
4 8	5 0	
Women between the ages of 18 and 60	s. d.	s. d.
3 8	4 0	
Boys under the age of 18	2 9	2 11
Girls under the age of 18	2 3	2 5

Note: In the above tables of contributions the initial rate means the rate payable as from the appointed day for the introduction of the new pension rates under this Act; the permanent rate means the rate payable after the expiration of five years from the date of the introduction of the new pension rates.

The above rates exclude contributions under the industrial insurance scheme (see WORKMEN'S COMPENSATION) but include contributions to the national health service. Men aged seventy and over and women aged sixty-five and over pay no contributions. Men aged sixty-five to seventy and women aged sixty to sixty-five pay only if they are working and have not retired from regular employment. These provisions, however, do not affect the employer's liability to pay contributions.

EXCHEQUER SUPPLEMENT

<i>Description of person by or in respect of whom contribution is paid</i>	<i>Amount of Supplement</i>			
	<i>For contribution as employed person</i>	<i>For employer's contribution</i>	<i>For contribution as self-employed person</i>	<i>For contribution as non-employed person</i>
Men over the age of 18	s. d.	s. d.	s. d.	s. d.
1 1	1 0	1 1	9	
Women over the age of 18	10	9	11	7
Boys under the age of 18	7	7	7	5
Girls under the age of 18	6	5	6	4

The contributions are to be increased, at the end of 5 years from the date when existing pensions are raised, by 4d. Generally, contributions are paid by means of stamps on a single insurance card. For an employed person the stamp covers industrial injuries insurance as well as insurance under this Act and the responsibility for paying contributions rests primarily on the employer, but he may deduct the worker's share from the worker's wage. Exemptions from payment of contributions may apply to those unemployed or incapable of work, those drawing pensions or other benefits, or those under full-time education or unpaid apprenticeship, and such persons will be credited with contributions. People earning under £104 a year may claim exemption. The benefit rates and contributions are to be reviewed by the minister of national insurance every five years so that the purpose of providing social security may be safeguarded. The central administrative body under the Act is the Ministry of National Insurance, which has regional and local offices throughout the country. The Act provides for the transfer of the administration of sickness and maternity benefit from the "approved societies"—generally friendly societies, which were an integral part of the earlier national insurance schemes—and for compensation of their staffs where necessary.

Contribution Conditions.—For unemployment or for sickness benefit: (a) twenty-six contributions paid between entry into insurance and the day for which benefit is claimed; and (b) not less than fifty contributions paid or credited in respect of the last complete contribution year before the beginning of the benefit year. For maternity grant and attendance allowance: (a) not less than twenty-six contributions paid between entry into insurance and day of confinement and not less than twenty-six paid or credited in respect of the last complete contribution year before confinement. For maternity allowance: not less than forty-five contributions paid by or credited to the claimant in respect of the fifty-two weeks immediately preceding the period for which the allowance is payable. Widows' benefit or retirement pension: not less than 156 contributions paid in the period between entry into insurance and the date of

reaching pensionable age or dying under that age, and a yearly average of contributions paid or credited of not less than fifty. For death grant: not less than twenty-six contributions between entry into insurance and the deceased's death and not less than forty-five paid or credited in respect of the last complete contribution year or a yearly average of at least forty-five contributions.

Sickness and Unemployment Benefit.—Employed persons can qualify for both; self-employed persons for sickness benefit. *Rates.* The weekly rate of sickness and unemployment benefit for a man or single woman over eighteen is 26s. The ordinary rate for a married woman over eighteen is 20s. for unemployment and 16s. for sickness. But a married woman over eighteen receives the same rate as a single woman, if she is supporting an invalid husband, or if she is not living with her husband and cannot obtain any financial help from him. There are lower rates for persons under eighteen. Where the applicant has a wife living with him, or mainly maintained by him, or has an adult dependent, he will receive an extra 16s. a week. Where he has a child in his family, he will receive an extra 7s. 6d. A woman applicant who has dependents receives similar allowances. The child's allowance of 7s. 6d. will be paid only for the first child in any family, who will not count for family allowances.

Duration of Benefit.—During the same spell of absence from work an insured person can draw: (a) sickness benefit without limitation of period if he has paid at least 156 contributions at any time; (b) 180 days of unemployment benefit, together with additional days of benefit, assessed on his record of contributions and benefit. Two spells of absence from work count as one if not separated by more than thirteen weeks. When an insured person has exhausted his right to benefit of either kind he can requalify for that benefit when he has paid thirteen more contributions. *Disqualifications:* Refusing an offer of suitable employment; in the case of sickness benefit, failing to comply with rules of behaviour.

Maternity Benefits.—For a confinement a woman will receive a maternity grant of £4 on her husband's insurance or on

her own. For a woman who ordinarily follows a gainful occupation there is in addition a maternity allowance of 36s. a week for thirteen weeks, beginning six weeks before her confinement is expected, provided she abstains from work. For other women there is, instead, an attendance allowance of 21s. a week for four weeks in addition to the maternity grant.

Widows' Benefits.—A widow will qualify on her husband's insurance for an allowance of 36s. a week for thirteen weeks. If she has been left with a child of school age she will receive an extra 7s. 6d. a week during those thirteen weeks, and will thereafter receive a widowed mother's allowance of 33s. 6d. a week (for herself and the child), so long as she has a child of school age. If she is over forty when this allowance ceases, and ten years have then elapsed since the date of her marriage, she will qualify for a widow's pension of 26s. a week. A widow who is left without any children of school age will receive a widow's pension of 26s. after the period of her widow's allowance, if she had reached the age of 50 when her husband died, provided that ten years had elapsed since the date of her marriage. If, by reason of mental or physical infirmity, a widow is incapable of self-support at the time when her widow's allowance ceases, she will receive a widow's pension of 26s. so long as she is incapable of self-support. A widow whose husband had qualified for retirement pension before his death will receive the ordinary widow's benefits as above specified, if she is then under sixty. If she is over sixty, any retirement pension which she is already receiving will be raised to the single person's rate. Both widow's pension and widowed mother's allowance will be reduced, if the widow earns more than 20s. in any week by 1s. for every 1s. she earns over 20s.

Guardian's Allowances.—Where the parents (including step-parents) of a child are dead, and one at least of them was insured under the scheme estab. by this Act, any one who has the child in his family will qualify for a guardian's allowance of 12s. a week. There is statutory power to extend the allowance to cover certain cases excluded from the previous scheme.

Retirement Pensions.—An insured person who (a) has reached pension age (sixty-five for a man and sixty for a woman); (b) has retired from regular employment, and (c) has paid the prescribed number of contributions will receive a retirement pension for life at the rate of 26s. a week. Men aged seventy and over and women aged sixty-five and over do not have to satisfy condition (b). Where a man aged sixty-five to seventy or a woman aged sixty to sixty-five does any work after having qualified for pension, and earns over 20s. in any week, the pension will be reduced by 1s. for every 1s. the pensioner earns above 20s. Where the insured person postpones his retirement beyond pension age, his pension, when he qualifies for it, will be increased by 1s. for every

twenty-five contributions he pays in the five years after pension age. **Wives.**—If a pensioner has a wife under the age of sixty, either living with him or mainly maintained by him, he will get an extra 16s. a week for her, provided she is not gainfully occupied. When a man qualifies for pension, his wife, if she has reached sixty, will be entitled to a separate pension on his insurance. The basic rate for the pension will be 16s. a week, but it will be increased by 1s. a week for every twenty-five contributions the husband pays after he has reached sixty-five and she has reached sixty. A wife insured in her own right can draw retirement pension on her own insurance, even though her husband has not retired. **Widows.**—A widow will qualify on her late husband's insurance for a retirement pension of 26s. a week if, immediately before reaching sixty, she was drawing one or other of the various widow's benefits under this Act. **Non-contributory Pensions.**—Any one who had reached fifty-five years of age when the new pensions under this Act began to be paid, will qualify, subject to his means, for a non-contributory pension on reaching seventy, if he or she is not qualified for a retirement pension.

Death Grant.—This grant is payable for the expenses connected with the death of an insured person or with the death of his wife, or child, or widow. Where the insured person is a woman a grant is payable on the death of her husband or child. The grant is £20 for an adult; £15 for a child aged six to seventeen; £10 for a child aged three to five; £6 for a child under three.

The cost of the benefits under the new scheme estab. by this Act is estimated at £452,000,000 in 1949, rising to £462,000,000 in 1950 and to £496,000,000 in 1955. The Exchequer's share will be £118,000,000 in 1949, £122,000,000 in 1950, and £143,000,000 in 1955. In the gov. actuary's report on the financial provisions of the Bill when it was introduced in 1946 the estimated expenditure over the next thirty years was as follows:

Estimated Expenditure, in £ millions.

1948-78

Benefits	1948	1958	1968	1978
Retirement pensions	238	301	421	501
Widows' benefits and guardians' allowances	22	35	42	40
Unemployment benefit	94	94	94	89
Sickness benefit	70	83	86	81
Maternity benefits	9	8	8	8
Death grant	*1	6	9	12
Cost of administration	18	18	18	18

* A notional figure depending on the date of the commencement of the benefit.

In another table the actuary gives the estimated yields of contributions for benefits under the Bill and towards the national health service:

and public control, as e.g. in a Town and Country Planning Bill which was introduced in Jan. 1947 (q.v.) and a Bill which proposed not N. of the land but rather

Yields of Contributions in £ millions

<i>Contributions by Insured Persons and their Employers</i>			<i>Contributions by Exchequer</i>	
<i>Calendar Year</i>	<i>For benefits</i>	<i>Towards Health Service</i>	<i>Total</i>	<i>For benefits</i>
1948	313	36	349	82
1958	334	37	371	83
1968	335	37	372	83
1978	312	35	347	78

National Insurance (Industrial Injuries) Act, 1946. See WORKMEN'S COMPENSATION.

Nationalisation, acquisition by the State of land or any public utility, usually by purchase; or, in Socialist polities, the acquisition by the State of all the means of supply and distribution. N. has, of course, been carried to extreme lengths in Soviet Russia; but in other countries it has been restricted until recently to public utilities, such as telegraphs and telephones. In Canada, Australia, and some other countries some or all of the railways have been nationalised. The N. of the land has, at times, been proposed in Great Britain, but no substantial progress has been made by societies existing for that purpose. The Brit. Labour party has long advocated N. of the mines and railways and both these had a measure of gov. control during both World Wars. In its election appeal in 1945 the Brit. Labour party declared its intention to ensure a more equitable distribution of the nations' wealth among the community and, to achieve this aim, the Lab. Gov. which came into power in Aug. 1945 proposed public ownership of the coal mines, the iron and steel industry, inland transport, and the Bank of England. A Bill providing for public ownership of the Bank of England became law in 1946. A Bill to nationalise the coal mines was also passed with the same lack of controversy, largely because the country was already committed to the change by the findings of the Sankey Commission of 1919 and by those of the Reid Committee of 1945. A Bill to nationalise railways and other inland transport was approved in principle but its original proposals were considerably amended. Similarly, while the gov. was committed to pass a Bill establishing a measure of public ownership in the iron and steel industry, it experienced some difficulty in drafting a Bill which would survive not only the criticism of the Opposition but also the div. of opinion on amount and method of compensation among its own members. In some fields of enterprise new legislation attempted to compromise between private ownership

of profits from its development and improvement, taking away from the land-owner the right to decide when and for what purpose his land might be developed. Again, a Control of Investments Bill purported to give the State control over issues of bonds to finance new undertakings and empower the gov. to guarantee priority to projects in which the community interest would be served. See further under GREAT BRITAIN, History.

Nationalism, spirit of nationality, the predominant feature of the modern state-system and, in the language of political thought to-day, the antithesis of internationalism. In an age when political ideas and doctrines have become the staple of current conversation, N. has occupied the forefront of discussions of foreign affairs as one of the idea-forces (*idee-forces* as Fr. publicists style them) which are active in the contemporary world and constitute so large a part of the compelling power of latter-day power politics. N. is not to be confused with racialism, for many races may be incorporated in one nation-state, though racialism was the strongest element in the particular type of N. preached by Hitler and, to some extent, it is implicit in the ideas of Herder on the nation as an enlarged family. N. was the inevitable sequel to the growth of the nation-state out of feudalism and the medieval conception of sovereignty as developed by Machiavelli, Hobbes, Locke, and Rousseau. N. is a commonplace to-day because it is but natural that a politically compact people, speaking the same language and sharing the same historical traditions and social customs or adherent to the same creed should be united politically as a sovereign independent nation. While as a political institution N. has never been susceptible of clear definition, it is evident that it is only with the growth of the modern spirit of nationality that the complex problem of the national state arises. Different writers give varying emphasis to the contributory factors noticed above, yet it is probable that none of them, whether religion,

language, ter., tradition, or economic interests can claim monopoly or even predominance. Unity of language is a strong factor in national unity but by no means decisive; for Soviet Russia, where there are hundreds of different languages, has given dramatic proof of the strength of her national cohesion; while, conversely, a common language did not operate to prevent the separation of the Amer. colonies from England. Unity of religion may have formed the national character of the Spaniards or the Scots, but the great religious split between Protestants and Catholics has markedly failed to prevent national unification in Germany. Unity of economic interest has more often than not been ignored in favour of more irrational considerations—the hist. of the peace treaties of 1919 shows an almost uninterrupted record of N. cutting across economic ties. Perhaps the most prevalent influence is community of hist., tradition, and culture, difficult to define in general terms, but altogether exercising an immensely powerful influence; for in Renan's classic definition: 'A nation is a soul, a spiritual principle... The existence of a nation is a daily plebiscite, just as that of the individual is a continual affirmation of life' (Renan, *Qu'est ce qu'une nation?*, 1882). Certainly patriotism may be the dominant note with individual political thinkers, as illustrated by Mazzini's stirring address to his fellow countrymen (*To the Young Men of Italy* (1859)) to take up arms against their foreign masters. What is, however, incontrovertible is that in the early nineteenth century N. was a revolutionary force, deriving its impetus from a sense of tyranny among many peoples who were far from enjoying political freedom. This revolutionary force was most strikingly exemplified in France, under the inspiration of the teaching of Rousseau, which 'invested the gospel of fraternity among men of the same nation with all the finality of a scientific dogma' (Carlton Hayes). This teaching spread to other nations of Europe and within a century the spirit of nationality produced an independent Greece, Belgium, Serbia, Norway, Italy, and Germany. It is, however only gradually, though with increasing momentum, that N. has become an articulate force throughout the world; thus the consciousness of nationality was only awakened among the Chinese by the labours of Sun Yat-sen, though in his *Three Principles of the People* (1924) he speaks of his country's 'lost nationalism, the revival of which is the divine mission of its four hundred million people.' Under this revolutionary influence the peoples of each of the European countries above mentioned became conscious of nationality for the first time in their hist., with all its implications, the chief of which was that patriotic men of the same nation should be brothers-in-arms ready to defend their liberties and traditions, their customs or way of life against the tyrant and their hearths and homes against the external aggressor. Whatever its defects in the eyes of political

thinkers, N. has yielded impressive results in political democracy, inspiring great deeds, stimulating art and literature, and promoting popular education. But undoubtedly the concept of N. was employed too often to emphasise to citizens what was peculiar in tradition and achievements to their own nation, rather than to what mankind shared by way of common heritage. It emphasised the exclusiveness of each state and it encouraged selfishness in a new and national form in the same way that individualism and *laissez-faire* had promoted the prosperity of the bourgeoisie of all the great trading nations of the world at the expense of the proletariat. It brought nations which had not yet achieved complete unity and independence, like the Poles, the Irish, and the Czechs, into conflict with more fortunate nations; while in the fortunate nations it induced selfish intolerance which led to the oppression of dissident minorities and to the forcible imposition of their own civilisation arbitrarily upon those whom they regarded as 'inferior' races. Thus N. or the national theory marks the end of the revolutionary doctrine and its logical exhaustion and, in proclaiming the supremacy of the rights of nationality, the system of democratic equality goes beyond its own extreme boundary and falls into contradiction with itself' (Lord Acton, *Essay on Nationality*, 1862). Yet N. had an important mission in the world by marking the final conflict and end of two forces which are the worst enemies of civil freedom—the absolute monarchy and the revolution. Ideally N. should have led, not regressively to eighteenth-century indifferent cosmopolitanism, but towards twentieth-century internationalism, to a confederation of the free nations of the world for mutual co-operation and support. It was the tragedy of N. that on the eve of the First World War it had not led to this goal, and this fact has focused the attention of numerous publicists on its influence as the major predisposing cause of that war. N. was no less a decisive factor in bringing about the Second World War. Ger. N. became so aggressive that it sought to interfere in the affairs of other states wherever there were minorities of Ger. large or small in those states. Everywhere in the twentieth century the spirit of nationality operated to reinforce the anarchy both of international politics and of international economics. 'Modern imperialism, curiously enough, became an arc on the circle of exclusive nationalism. It was a vicious circle and the only way to break it seemed to involve the method most terribly anarchic—war' (Hayes). Conversely N. in the U.S.A., whose public opinion has a profound effect on policy the world over, was so narrowly involved in what may be called the Amer. way of life as to stress isolationism and to turn away from internationalism even at the cost of security. A most important development of N. in Germany, Japan, and the other newer States was the economic activity of the State in which theories of a planned economy acquired

force from protective tariffs as an integral factor of political strategy. In modern Germany this has been especially exemplified by the malign activities of the I. G. Farben Trust in exploiting, or in aiming at the exploitation of, the whole continent of Europe; but a development so directly in conflict with the individualism of liberal political theory, far from being a highly modern one, has its inspiration in the economic doctrines of Johann Gottlieb Fichte, Adam Müller, and Friedrich List. The emergence of Japan as a national state affords striking parallels to that of Germany in spite of the very different racial, historical, and social background, the nobility, feudal leaders, and merchants creating a modern state which rested on very similar foundations to those of the Germany of Hitler. If in the older national states (Britain, U.S.A.) political authority and economic interests did not co-operate in a common plan, the exigencies of war have resulted in assimilating their relative position closely to that of the totalitarian states. Some political theorists think that a crisis threatens the modern nation-state from two utterly opposed quarters — the international monopolies and cartels which necessarily induce a deadly conflict between national loyalty and international economic interests; and the ideology of Communism, which accentuates social conflict as against national community, ranging members of the same economic and social class together in opposition to other classes within the same nation. N. of all kinds is, to Marxism, a device of capitalist domination over the workers. See C. J. Hayes, *A Brief History of the Great War*, 1920; B. Russell, *Freedom and Organisation 1814-1914*, 1934; J. Huxley and A. Haddon, *We Europeans*, 1935; H. Laski, *The State in Theory and Practice*, 1935; P. Henry, *Le Problème des nationalités*, 1937; R. Crossman, *Government and the Governed*, 1939; *Nationalism*, by study group of Royal Institute of International Affairs, 1939; A. Zimmern (ed.), *Modern Political Doctrines*, 1939; E. H. Carr, *The Future of Nations*, and *The Twenty Years Crisis*, 1939; E. Norman, *Japan's Emergence as a Modern State*, 1940; W. Friedmann, *The Crisis of the National State*, 1943; and H. M. Chadwick, *The Nationalities of Europe and the Growth of National Ideologies*, 1945.

Nationalist Party (Irish), Irish political movement for Home Rule (q.v.) which became an important force in the Brit. House of Commons in the late seventies of last century under Parnell (q.v.). When the Liberals and Conservatives were of almost equal strength the Nationalist vote was of vital importance. John Redmond (q.v.) succeeded Parnell as the party's leader in 1890. It became defunct in 1918 on the rise of Sinn Fein (q.v.).

Nationality Act, British (1948). This Act, which was enacted on July 30, 1948, replaces the British Nationality and Status of Aliens Act of 1914 as the basis of the law of Brit. citizenship. Every person who, under this Act, is a citizen of the United Kingdom and Colonies, or who is

or becomes a citizen of Canada, Australia, New Zealand, the Union of S. Africa, India, Pakistan, S. Rhodesia, and Ceylon, shall by virtue of that citizenship have the status of a Brit. subject. Every such person having such status has the choice of being known as a Brit. subject or as a common citizen of the commonwealth, both expressions having the same meaning (this proviso was made because some might not wish to be called Brit. subjects, e.g. Fr. Canadians or Indians or Sinhalese). The Act provides a new method of giving effect to the principle that the people of each self-governing country within the Brit. Commonwealth have both a particular status as citizens of their own country and a common status as members of the commonwealth. Under a common clause accepted by all the commonwealth countries (except Eire (q.v.)) all persons recognised as Brit. subjects in any part of the commonwealth are recognised as such throughout the whole of it. To preserve the principle of complete unity of status, there is a single citizenship, governed by identical conditions and applicable without distinction to the peoples of the United Kingdom and Brit. colonies. The permanent provisions governing the acquisition of citizenship of the United Kingdom and colonies are based on the principles previously governing the acquisition of Brit. nationality under the Act of 1914. The first generation b. in another commonwealth country of a father b. in the United Kingdom or colonies, is a citizen of the United Kingdom and colonies, but not the second generation. Citizens of the United Kingdom and colonies who acquire citizenship of other commonwealth countries (i.e. possessing 'dual citizenship') may, if they wish, denounce their citizenship of the United Kingdom and colonies. Citizens of Eire cease to be Brit. subjects, though Eire citizens in the United Kingdom at the time the Act was passed continue to have all the rights and obligations of Brit. subjects and all Eire citizens are treated under Brit. law in the same way as Brit. subjects and not as aliens. The Act removes women's disabilities as regards nationality, and for nationality purposes married women are placed in the position of single women. From the date when the Act became law, women citizens of the United Kingdom and colonies do not, as theretofore, lose their citizenship on marriage to aliens, and may only divest themselves of it by a formal act of renunciation. Women married to aliens when the Act was passed, had their nationality restored, becoming citizens of the United Kingdom and colonies or of some other commonwealth country. Alien women marrying citizens of the United Kingdom and colonies no longer automatically acquire citizenship on marriage, but if they desire may apply for registration, to be granted in the home secretary's discretion. Women citizens of other commonwealth countries on becoming citizens of the United Kingdom and colonies do not automatically acquire their husband's citizenship, but may claim it as of right,

whether or not they are resident in the United Kingdom or colonies.

In April 1949 Eire became, by her own action, a republic and left the commonwealth. But, in fulfilment of the Brit. Prime Minister's promise that S. Irishmen would not be treated as foreigners in the United Kingdom in spite of their country's unilateral action in declaring her independence of Crown and commonwealth, the United Kingdom Parliament in May introduced the Ireland Bill, one purpose of which was to confirm citizens of the new republic in all the rights which they held in the United Kingdom while Eire was still a member of the commonwealth. The effect of the Bill is that inhabit. of Eire can claim to remain Brit. subjects or, if they prefer, be citizens of the republic of Eire and still reside in the United Kingdom on the same conditions as in the past. A new clause was inserted in the Bill as the result of an amendment by the Lords to which the gov. agreed. It made clear that, whatever might be the position under Fire law, a person b. in S. Ireland of S. Irish father, who was domiciled in N. Ireland on Dec. 6, 1922, and who had not acquired Eire citizenship by residing permanently in S. Ireland on or after April 10, 1935, or by registering as an Eire citizen, did not cease to be a Brit. subject on Jan. 1, 1949, and became on that date, a United Kingdom citizen unless he was a citizen or potential citizen of some other commonwealth country. But the special status thus accorded to Irish citizens by this Bill involves questions in international law and international relationships which are not within the competence of the Brit. Parliament to settle, and indeed they remain to be answered.

National Liberal Club of London, is the headquarters in Great Britain for social purposes of the Liberal party. The club, which was opened in 1887, is pleasantly situated on the Thames Embankment near Charing Cross station, and houses the Gladstone Library of 25,000 books, mainly political and sociological.

National Parks. The phrase national park is variously used in different countries. The definition adopted by the N. P. Committee (England and Wales) is that of Mr. John Dower's *Report on National Parks* (Cmnd. 6628), viz. 'an extensive area of beautiful and relatively wild country in which, for the nation's benefit and by appropriate national decision and action, (a) the characteristic landscape beauty is strictly preserved; (b) access and facilities for public open-air enjoyment are amply provided, (c) wild life and buildings and places of architectural and historic interest are suitably protected, while (d) established farming use is effectively maintained.' The Committee mentioned above was appointed in July 1945 by the minister of town and country planning to consider the areas proposed in the Dower report and their special requirements, the measures necessary to secure the objects of N. P., and the conservation of wild life. The committee produced its detailed

scheme in June 1947 (Cmnd. 7121) recommending the estab. of twelve N. P. by ann. instalments of four over a period of three years, as follows: (first instalment) The Lake Dist. (892 sq. m.), N. Wales (870 sq. m.), The Peak Dist. (572 sq. m.), Dartmoor (392 sq. m.); (second instalment), The Yorkshire Dales (635 sq. m.), The Pembrokeshire Coast (229 sq. m.), Exmoor (318 sq. m.). The S. Downs (275 sq. m.); (third instalment) The Roman Wall (193 sq. m.), The N. Yorkshire Moors (614 sq. m.), Brecon Beacons and Black Mts. (511 sq. m.) and The Broads (181 sq. m.). The Cornish Coast, one of the ten areas chosen first in the Dower Report, was omitted because of administrative difficulties in treating it as a national park, but it is among the 'conservation areas' scheduled for a somewhat different and looser form of administration. These conservation areas include such diverse stretches of scenery as the N. and S. Pennines, the Wye Valley, the New Forest, Charnwood Forest, and other famous localities varying in size from 633 to 11 sq. m. Control of the parks is proposed in two parts, central and local. At the centre there is to be the N. P. Commission, appointed by the minister of town and country planning and financed by the Exchequer. The task of this Commission is to evolve a common policy throughout the parks, to integrate it with the national and local economies, and to keep close touch with the Ministry of Agriculture, the Forestry Commission, and the Biological Service, which is one of the proposals put forward by the Wild Life Conservation Special Committee (Cmnd. 7122). This latter report recommends a nation-wide biological service under a permanent nature conservation board to preserve and study the wild life of England and Wales. The main recommendation is that the gov. should take general responsibility for conserving and controlling the country's flora and fauna and should also protect the geological and physiographical features on which the plants and animals live and depend. These measures would entail the expenditure of public money on taking over the management of the reserves and in employing scientists; but (according to the report) the benefits would be great and would extend over agriculture, forestry, game preserving, park and estate management, fresh-water fisheries, as well as water supply, drainage, quarrying, and many aspects of civil engineering. Recognition of the inalienable rights of the National Trust over its properties is to be found in the provision protecting them from compulsory purchase. The onus of upkeep of public footpaths is put on the highway authority, with power to reclaim from private persons discovered to be under customary obligation, though it is suggested by many that the public interest would be better served by removing such private obligations altogether. Not all the proposals of the N. P. Committee have been adopted in the Bill, but quite enough to mark a great advance in the preservation of the country.

side and the provision of access to its most attractive areas.

After the Bill had passed through Standing Committee and been re-committed to the Commons, the terms of service of N. P. commissioners were improved, and they may now be members of Parliament. But their powers and status are derived entirely from the minister of town and country planning. They may make recommendations and notify their opinions; they may even call upon the minister to inquire in private why their recommendations have not been acted upon, and in some cases ask him



Australian News and Information Bureau

PORT HACKING NATIONAL PARK, NEW SOUTH WALES

The Prince's Highway, Bull's Pass, near Sydney.

to use his powers in default. This, however, seems to be the limit of their powers, which, for the rest, are restricted to advising the minister and the existing planning authorities. Some contend that what is needed is a strong and independent commission and that the local administration of N. P. should be entrusted to bodies outside the control of the local planning authorities, because the interest to be upheld is a national one, and is bound to conflict at many points with local self-interest.

National Parks in Africa.—The Brit. Gov. presented to an international conference in London (1933) a draft convention relative to the 'preservation of fauna and flora in their natural state' and the delegates, considering that the natural fauna and flora of certain parts of the world, and in particular in Africa, were in danger, accepted the convention in all

essentials as regards the continent of Africa. It was hoped by advocates of conservation that, after the war, the United Nations, under the lead of Britain, would adopt a world-wide convention on the lines of the 1933 convention, for that convention contained a number of excellent provisions for wild life conservation. Unquestionably the keynote of the convention was the proposal to establish the national park, inalienably set aside under public control as a sanctuary. A miniature national park of about 40 sq. m. has been estab. near Nairobi. Beyond this no N. P. have been made in any Brit. African dependency. Kenya has passed a National Parks Act, and in 1948 by a formal resolution in the Kenya Legislature it was decided to establish the Tsavo National Park of 7000 sq. m. (see under KENYA). In Tanganyika an area in the Serengeti has been declared a national park, but the park is under no control. There are, of course, many 'game reserves' in the various colonies, in which hunting is controlled, but the administration of such reserves, as of the other provisions of the convention, is governed by the adequacy of departmental staffs, and it is believed that in no colony except N. Rhodesia is the staff adequate to the duties they should be called upon to perform. It is, however, also to be emphasised that frequently official policy aims at destruction rather than conservation, particularly in fly-belt areas where farmers near the reserves demand the slaughter of game animals on the supposition that it is only by the extermination of such animals that the tsetse-fly can also be exterminated (see C. F. M. Swynnerton, *The Tsetse Fly of East Africa, their Ecology and Control*).

For a list of the N. P. and reserves of Canada, see under GAME RESERVE. A description of the great Yellowstone and Yosemite N. P. of the U.S.A. will be found under those names. The chief Australian national park is at Port Hacking, New S. Wales (area 57 sq. m.), and lies 15 m. S.S.W. of Sydney, bordering on the Pacific for 7½ m.

National Park, Scottish, see under SCOTLAND.

National Physical Laboratory, The, was opened in 1902, managed by an executive committee and general board, but under the ultimate control of the Royal Society, with the object of assisting industries, research, etc. It is situated at Teddington, Middlesex. There are nine main depts.: (1) Physics; (2) Light; (3) Electricity; (4) Radio; (5) Metrology; (6) Engineering; (7) Aerodynamics; (8) Metallurgy and Metallurgical Chem.; (9) The Wm. Froude Laboratory. Observations on terrestrial magnetism, the electricity of the atmosphere, etc., are carried on, and a large number of barometers, thermometers, etc., are tested, on payment of a small fee. The physics dept. deals with questions of maintaining electrical standards, photometry, optics, thermometry, etc. The engineering dept. investigates the behaviour of bodies under sustained and intermittent pressure, impact, etc.

and tests road materials. The metallurgical dept. carries on research connected with the constitution of metals, alloys, etc. The Wm. Froude laboratory carries on experiments on model vessels. The aerodynamics dept. deals with the numerous problems of mechanical flight. A collection of abstracts of all papers pub. by the laboratory, and the results of researches, are issued annually.

National Playing Fields Association. exists to provide adequate playing fields for all sections of the community, and playgrounds for children. The greater provision of opportunities would mean a considerable improvement in general health, would materially reduce the number of juvenile delinquents, and would appreciably decrease the toll of deaths on the road among children while at play. The association endeavours to ensure the acquisition, layout, and construction of playing fields, protects existing fields from appropriation for other purposes, helps to secure gov. grants, uses its influence to persuade local authorities to make use of their permissive powers for the provision of recreation grounds, and gives expert technical and legal advice on layout and specifications and other matters connected with conveyance, dedication, trusteeship, etc. The London and Greater London Association is an organisation within the national body, and is concerned with the immense problem of catering for the considerable needs of the metropolis. The duke of Edinburgh is president of the N. P. F. A., which was founded in 1925.

National Portrait Galleries. The gallery in London was founded in 1856, estab. at S. Kensington in 1869, and finally moved to the present building to the N.E. of the National Gallery in 1896. Its chief feature is the collection of portraits of Brit. historical characters, the upper rooms containing portraits, arranged chronologically, of the sovereigns from Richard II., Chaucer, Shakespeare, Cromwell, and the two Pretenders, while the lower rooms contain portraits of celebrated statesmen, divines, and others. There are specimens of Van Dyck, Reynolds, Gainsborough, Romney, Raeburn, Lawrence, and G. F. Watts. There is an admirable catalogue by the first director, Sir George Schatz, K.C.B. (1820-95). For the Scottish National Portrait Gallery, see under EDINBURGH.

National Provincial Bank, Ltd. This is one of the 'big five' joint-stock banks in the Eng. banking world and was estab. in 1833, the first branch being opened at Gloucester in 1834. On Jan. 10, 1866, the bank started to do banking business in London, and sacrificed, by this step, its right to issue its own notes. In 1874 the institution was registered as an unlimited company under the Companies Acts, but on April 8, 1880, it was decided to register the bank as a limited liability company. In 1918 amalgamations were made with the Union of London and Smiths Bank and the Bradford Dist. Bank. In the following year the Sheffield Banking Company was also absorbed and sev. other banks have been taken over since the First

World War. As at Dec. 31, 1941 the authorised capital was £60,000,000 of which £9,479,416 was paid up. The head office of the bank is situate at 15 Bishops-gate, London, E.C.2.

National Range, see SAWATCH.

National Reform Union, association founded in 1861 by members of the committee of the Anti-Corn-Law League (*q.v.*) to promote political reform. It was re-organised in 1875; lecturers are sent out by the union, and political literature widely distributed. The objects include the promotion of the formation of Liberal organisations, the propagation of political knowledge, and the discussion of topical questions.

National Register, census of Great Britain, taken on Aug. 15, 1911 and Sept. 10, 1939 to facilitate the best use of manpower, for rationing purposes.

National Research Development Corporation, was set up by the Development of Inventions Act which was passed July 30, 1948. The object of the Act is to secure for Brit. industry the maximum benefits for inventions and discoveries by Brit. scientists. The corporation's functions are (*a*) to secure, where the public interest requires it, the development or exploitation of inventions resulting from research by gov. and other publicly financed organisations, and any other inventions which it considers are not being sufficiently developed or exploited; and (*b*) to accept, acquire, and hold rights in inventions (including new processes and techniques) and to grant or dispose of such rights for consideration or otherwise. The corporation, which in its work must comply with the general directions of the Board of Trade, has no special powers of acquiring patents, *i.e.* it cannot compel private firms owning, and suppressing patents to sell them, and inventors are in the same legal relations to it as to patent agents. The Board of Trade may advance to the corporation (within five years of its estab.) up to £5,000,000 for working capital, without interest for the first five years. The corporation may borrow temporarily up to £2250,000 for general or specific purposes, whilst if it is asked by a gov. dept., in the public interest, to carry out a project which results in a loss, the latter may be recouped from public funds.

National Rifle Association, founded in 1860, and incorporated by royal charter in 1890, to encourage rifle shooting in the king's dominions. From 1860 to 1889 meetings were held at Wimbledon, after which they were held at Bisley. The first shot at the first meeting at Wimbledon was fired by Queen Victoria from a Whitworth muzzle-loading rifle. The competitions at Bisley attract marksmen from all parts of the world. For particulars as to prizes, range, etc., see BISLEY. The offices of the association are on Bisley Camp Ground, Brookwood, Surrey.

National Savings Certificates, first issued in Feb. 1916, to raise money for the First World War, since when there have been sev. later issues and one conversion issue. The first issue was at the cost price of 15s. 6d. each certificate, with a maturity

value of 26s. after ten years and interest at 1d. a month after the tenth year; the price of the other issues was 16s., excepting the sixth and seventh which were 14s., and the period ten years for the second, third, conversion, and sixth and seventh issues, eleven years for the fourth issue, and twelve years for the fifth issue. Maturity values were, for the first and second issues, 26s., 24s. for the third issue or 28s. and 33s. If held longer than the original period (and with higher interest if held for such longer periods), conversion issue, 24s., fourth and fifth issues, 23s., sixth issue, 20s., seventh issue, 20s. 6d., and eighth issue, 13s. The total number of certificates sold up to March 31, 1949, was 4,324,389,733 (excluding those of the conversion issue), representing a cash investment of £3,159,914,005. The amount, including accrued interest, relating to the credit of investors on March 31, 1949, was approximately £2,136,200,000. In 1947-1948 £223,750,000 was subscribed and £135,150,000 (excluding interest) was repaid.

National Socialism, Ger. nationalist movement led by Adolf Hitler. A Ger. National Socialist movement originated in 1912 in the National Socialist Labour party formed at Karlsbad (then in Bohemia) by a group of 'Unter Gers.', but no direct link of this party with that of Hitler has been proved. Hitler's party was founded at Munich by Drexler in 1919 as the Ger. Labour party and renamed the National Socialist Ger. Labour party by Hitler. In 1920 the party adopted a programme the chief aims of which included the union of all Gers., abrogation of the Versailles treaty, persons of Aryan blood only to be members of the nation, foreign nationals to be excluded from Germany, nationalisation of trusts, substitution of Ger. for Rom. law, nationalist education, and improvement of the nation's physique. Only the nationalist, as distinct from the Socialist, slogans were fulfilled, and from the year 1933, when Hitler came to power, no attempt at systematic Socialism in the traditional sense was made, though economic initiative and control passed entirely to the State, not out of regard for Socialist theory but in furtherance of the policy of rearmament. The Nazi (*q.v.*) party, the sole lawful political association in Germany, was based on the leadership principle and the party members had no rights in relation to the conduct of policy, which was the exclusive function of the 'Führer.' Subsidiary organisations of the party of a compulsory character were the Ger. Labour Front, comprising all employees, and the Hitler Jugend (Youth), and the party also organised its own military forces, the S.A. (*Sturm Abteilung* or storm troops) and S.S. (*Schutz Staffel*, protective squadron). After the S.A. purge of June 30, 1934, the S.S. or élite assumed greater importance in the party system. A party congress was generally held at Nuremberg every year. The original basis of the party lay in the middle class, which the Nazis promised to save from the ruin threatened by big business and the economic crisis, but while the

small trader's business increased, he suffered from heavy taxation and price control, while, later, 'superfluous' small shops and businesses were closed down altogether and the idea of saving the most needy section of the middle class was soon abandoned. See further under HITLER.

National Sporting Club, club for gentlemen interested in sporting and theatrical matters. It was started in 1891, and was long noted as the scene of the contests, both amateur and professional, in the boxing world. After the Second World War the club ceased to exist.

National Stud, Brit. state-sponsored racehorse breeding farm, founded by Lord Waverley in 1916. Its first centre was at Kildare, Eire, but in Oct. 1943, it was moved to Gillingham in Dorset. The N. S. is one of the prin. centres of the blood-stock industry, and the finest possible racehorses are bred for both the home and foreign market. Stamina and speed are carefully studied, and only horses with a long record of racing successes are kept for breeding. A stallion at the N. S., being national property, can be used by any owner with a mare good enough to be mated with him, and the stud fee is appreciably lower than on a good private stud farm. The king leases horses from the N. S. and pays the gov. one-third of any stake money he wins. Although nominally a non-profit making concern, the N. S. shows an accumulated profit of £195,000 since its foundation.

National Theatre (Britain). N. Ts. have existed for many years in other European countries than Britain. In France, for example, there has been such an institution for about 270 years. The movement for a N. T. in Britain is a comparatively recent development, and the first plans for a N. T. to be built by public subscription were laid by Harley Granville-Barker (*q.v.*) and Wm. Archer (*q.v.*) in 1903. Seven years later this scheme was combined with another already in existence, to provide a national memorial to Shakespeare. The appeal then launched by the Shakespeare Memorial N. T. Committee attracted many distinguished supporters and some contributions. The largest contribution was that of Sir Carl Meyer, who gave £70,000 towards the cost of building a theatre which it was hoped to open in 1916 in the tercentenary of Shakespeare's death, but this was prevented by the outbreak of war in 1914. It was not until 1937 that a site of one acre near the Victoria and Albert Museum was purchased, where it was proposed to erect the N. T., for which the committee had been collecting subscriptions. After the Second World War it was decided that the theatre should be erected in a more central locality. The L.C.C., who contemplated setting up a cultural centre in the area between the Co. Hall and Waterloo Bridge, offered to exchange a site on the S. bank of the Thames for the site in S. Kensington held by the Shakespeare National Memorial Committee and also to provide approaches and roadways to the centre. The Joint Council of the N. T.

and the Old Vic then had at its disposal about £70,000, but it was estimated that to build a worthy memorial theatre would cost about £1,000,000. This sum being outside the range of the Joint Council, it was decided that the gov. should ask Parliament to underwrite the project and to give guarantees and assurances that money up to £1,000,000 would be forthcoming as soon as it was possible to erect the memorial. The gov. accordingly introduced a two-clause Bill to that effect (1919). The first clause provided that the Treasury might make a contribution not exceeding £1,000,000 towards erecting and equipping the theatre and the second made provision for the appointment of trustees. The architects' plans provided for a building containing two theatres: one seating 1200 people, and the other about 500. There would also be accommodation for workshops, stores, conference rooms, library, canteens, and a public restaurant. It was also intended by the gov. to stimulate the art of the theatre and to organise N. T. tours throughout the country and overseas. In the gov.'s view the N. T. should be as much a national theatrical centre as a N. T. for the cap. of the commonwealth. In this connection it is to be noted that there is an Act of 1948 under which municipalities can begin to build municipal theatres and civic centres, so that they can receive the repertory companies and other players who would undoubtedly begin to tour from this national centre. The proposed N. T. is not to be looked upon solely as a memorial to Shakespeare, especially in view of the memorial theatre at Stratford-on-Avon; but rather as one of the first of a chain of living theatres throughout the country.

National Trust. The N. T. acquires lands and houses of natural beauty and interest to ensure their preservation. Founded in 1895 by Octavia Hill, Sir Robert Hunter, and Canon Rawsley, its status was confirmed by the National Trust Act, 1907, and later Acts of 1919, 1937, and 1939 confirmed and increased its powers. Lands or buildings bequeathed to the N. T. and declared inalienable, are exempt from death duties: properties are generally either self-supporting or accompanied by endowments of money or land. A tenancy may be substituted for a freehold, under the 'Country House Scheme' where the owner wishes continued residence for himself and his descendants. The trust is controlled by a president and a council of fifty, partly elected, and partly appointed by various representative bodies: any person may acquire membership. There are eight committees to deal with particular spheres of work, three regional, and six dist. representatives, and more than a hundred local committees. Under the Town and Country Planning Act of 1947 the N. T. is in the same position as an ordinary landowner, as regards its alienable land; for its inalienable land it does not share in the Land Fund and does not pay a development charge. The trust is financed by bequests left for the benefit

of particular properties, or the acquisition of new properties, and by public appeals.

Many types of land and property are preserved by the N. T. Its finest historic house is Knole, in Kent, a combination of country home, Renaissance mansion, eccles., palace, and feudal manor house, given in 1946 by Lord Sackville. There is also Little Moreton, Cheshire, a fine specimen of sixteenth-century half-timbered work; Montacute in Somerset, Bickliffe Hall in Norfolk, with an estate of 4500 ac., and others. Castles include Bodiam (c. 1386), Tattershall (c. 1440), and Lindisfarne (1550). There are nearly twenty pre-Rom. and Rom. antiquities, including Chedworth Rom. villa and Hadrian's Wall; Lacock Abbey is a fine example of medieval architecture. Whole vlls. have been placed under the trust's care: the Holnicote estate alone includes Selworthy, Allerford, Bossington, and Lutcombe. Tenants are found for more than 500 farms, 45 ac. of agric. land, and 20,000 ac. of grazing land owned by the trust. Many miles of coast in England, Wales, and Ulster are owned or protected. There are mts. such as Scafell Pike, moorlands like the 12,240 ac. of the Holnicote estate, and valleys like the 1250-ac. Dolmelynllyn estate on the Ffestiniog road. Ornithological reserves include the Farne Is. (Northumberland) purchased in 1924 by public subscription, the Galf of Man, Wicken and Burwell Fens. In 1918 the N. T. began to undertake the care of formal and informal gardens, and a joint committee with the Royal Horticultural Society was set up for this purpose: the first acquired was Hidcote in Gloucestershire, and others include Killerton, Packwood, and Stourhead. Bridges are also preserved, such as Stainforth Bridge in Yorkshire, Eashing in Surrey, and packhorse bridges in Somerset. The greatest single area possessed by the trust is Monk Coniston estate in Lakeland, of 3900 ac., bequeathed by Mrs. Wm. Heells (Beatrix Potter).

The headquarters of the N. T. are at 12, Queen Anne's Gate, London S.W.1: there is a separate N. T. for Scotland, and similar bodies have been instituted in other countries including Eire, Belgium, U.S.A., Australia, and New Zealand.

National Union of Teachers (N.U.T.). official organisation of the members of the teaching profession engaged in elementary or state-governed secondary schools, and may be termed the teachers' trade union. It was formed in 1870: (1) To associate and unite the teachers of the kingdom of England and Wales, (2) To provide means for the co-operation of teachers and the expression of their collective opinion upon matters affecting the interests of education and the teaching profession. (3) To improve the conditions of education in this country, and to obtain the estab. of a national system of education, and to secure for all public elementary schools adequate financial assistance and accommodation. (4) To afford to the Board of Education and other public or private organisations in connection with education the advice of the association. (5) To

secure the effective representation of educational interests in Parliament. (6) To watch the working of the various Acts of Parliament in connection with education, and to secure the removal of abuses. (7) To raise the status of the teaching profession, and to open the highest posts in the educational service of the country, including the inspectorate of schools, to the best equipped members of the union. There are also a provident society, a teachers' benevolent and orphan fund, and orphan homes in connection with the union. In addition to the above aims, the union affords advice and assistance to members in legal matters. The union examinations board conducts examinations and issues diplomas in various commercial and educational subjects. The present membership is about 150,000, being approximately 75 per cent of the total number of teachers. The executive of the N.U.T. is vested in a council consisting of the president, the vice-president, the ex-president, the treasurer, and thirty-three other elected members. In 1938 there were negotiations for affiliation or amalgamation with some or all of the numerous smaller teaching professional associations which include teachers in private and public schools. The secretary of the N.U.T. is Sir Frederick Mander, and the offices are at Cheltenham. See *The Yearly Handbook and Account of the Conference Proceedings*.

Nativity, name given to the Christmas season, celebrating the birth of Jesus Christ, which is fixed by the Church as Dec. 25. Also, the N. of the Blessed Virgin Mary is a festival in the Rom. Catholic Church, and celebrated on Sept. 8. This festival was formally appointed to be observed by the Synod of Salzburg in A.D. 800, but had in reality been celebrated since about 690. For the various usages in connection with the N. of Christ, see CHRISTMAS. In astrology, N. has the same meaning as horoscope.

Natrolite, zeolite, one of the common secondary products after minerals of the nepheline group. Is found in the basalts of Ireland and Scotland, Auvergne, etc. It has the composition $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_5 \cdot 3\text{SiO}_4 + 2\text{H}_2\text{O}$. Is white or yellowish-green. In colour and usually transparent (sp. gr. 2·2, hardness 5·5). Fuses in the candle flame, and gelatinises with acids, silica being liberated.

Natron, naturally-occurring sodium sesquicarbonate, $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$, formed by the gradual drying up of soda lakes. Deposits occur in many regions, notably near Lake Magadi in Kenya, in Mexico, Venezuela, Hungary, and the U.S.A. The N. Lakes are a group of lakes, some sixteen in number, situated in the Wady Atrum or N. Valley, Libyan Desert, Egypt, 60 m. W.N.W. of Cairo. The locality is also noted for four monasteries, from whose libraries many valuable MSS. have been added to European collections.

Natterjack, or **Rush Toad** (*Bufo calamita*), indigenous to W. Europe. Smaller than the common toad, with shortened hind limbs, short almost webless toes,

yellowish-brown, with bright yellow line running down the back. It moves by walking or short runs instead of hopping. The male has a vocal throat-sac which, when distended, is larger than the head. The eggs are laid in the water and the tadpoles are extremely small.

Natural (in music), the term applied to any un-inflected note. The normal key, which begins on C, is constructed on N.s. The sign \natural is used to cancel a preceding sharp or flat.

Natural Gas. In some parts of the world, gases of different composition are found associated with rocks of varying geological age. They are usually confined under pressure, and boring serves to free them from their site. The gases often consist of a mixture of hydrocarbons of the methane series in which the first member, methane, predominates. But there may be present ethane, propane, butanes, pentanes, hexanes, etc., as well as nitrogen, carbon dioxide, and sometimes helium and other rare gases. Occasionally hydrogen sulphide is present in fair amounts. These N. G.s. are frequently associated with oils. About 95 per cent of the world production of N. G.s. comes from U.S.A., whilst Canada is responsible for the larger proportion of the remaining 5 per cent. The gases are commonly carried for hundreds of miles along pipes and are employed for heating purposes, domestic and industrial. The calorific value is high (unless a high percentage of nitrogen is present), being in the region of 1000 B.Th.U. per cubic foot. In addition to this, N. G. has been put to useful advantage in the making of many valuable organic products such as methyl chloride, alcohol, etc., in the driving of gas engines (q.v.). In Utah, Colorado, and at Medicine Hat in Alberta there occurs a N. G. which is comparatively rich in helium, and by a process of fractionation all the other gases present are liquefied, whilst the helium is pumped off and purified as far as possible. This is the source of the helium employed in science and industry. The origin of this gas is probably radioactive transformations which have taken place in the past.

To some extent N. G. is found in coal mines, when it gives rise to the dreaded fire-damp. The mixture of the gas with air is apt to be a very explosive one, and as it has neither any particular colour nor smell it can only be detected by special means (see DAVY LAMP). Again the N. G. sometimes takes the form of carbon dioxide mainly. This, in virtue of its high density compared with that of air, is inclined to collect in pockets.

Natural History, term which originally meant the systematic study of all natural objects, animal, vegetable, and mineral, and thus included all sciences, such as biology, geology, chem., etc. With increasing knowledge and the growth of specialisation, such a term by its very vagueness became unsuitable in many cases. It is, wh. now used, practically synonymous with zoology, although by some naturalists it is confined to the study of the living organisms, thus not including

comparative anatomy. The name is gradually falling into desuetude, but survives in such titles as the Museum of N. H., or, to give it its true title, the Brit. Museum (N. H.).

Naturalisation, see under ALIEN.

Naturalism, term of philosophy which has borne different meanings according to its use. When now used it generally denotes the antithesis of idealism, and is akin to, though differing slightly from, materialism and pantheism. In theology it is the denial of the supernatural system of sanctifying grace.

Natural Order of Plants, system of classification of the members of the vegetable kingdom according to the structural and essential characters of each individual, grouping those together which agree in the greatest number of characters. A species comprises individuals which agree in all their constant characters; species similar in important respects are grouped into a genus which with related genera forms a natural order or family. Classes are still more comprehensive groups, and these are divided into the two sub-kingdoms Phanerogamia, or flowering plants, and Cryptogamia, or so-called flowerless plants.

Natural Philosophy, term denoting science as a whole, or that branch of it usually called physics at the present day. The philosophy of the ancients included the study of natural phenomena and hypotheses regarding their relations. As knowledge progressed, there was a tendency to subdivide science into various spheres. In the course of differentiation, the term natural philosophy was retained for that branch of science which does not deal with the ultimate structure of substances, but only with such phenomena as light, heat, sound, etc., which are independent of chemical conceptions. It is no longer possible to maintain such a separation. See also PHYSICS; HEAT, LIGHT; SOUND; MAGNETISM; ELECTRICITY. See Sir E. Whittaker, *From Euclid to Eddington*, 1949.

Natural Theology deals with such knowledge of God as may be attained by the human reason without recourse to the aid of divine revelations. The div. of Christian apologetics into two parts, revealed religion and N. T., is now generally given up, the whole subject being treated on a wider basis and the evidence being arranged according as it lies in the realm of physics, of psychology and metaphysics, of morality, or of the spiritual. The Eng. classical defence of N. T. is Wm. Paley's *Evidences of Christianity* (1794). The aim of the argument from natural religion is to prove that God exists and to evolve such notion of God as is attainable by pure human reasoning. This it strives to do from six main arguments: (1) That of general consent. The universal belief of mankind has more than a subjective value; it bears witness to a law impressed in our nature. (2) The cosmological argument, which, taking the world as the effect, argues *a posteriori* to a first cause. (3) The teleological argument, or argument from design, stated by Paley in his first

chapter, where he makes the well-known comparison of the world to a watch. (4) The ontological argument, which we owe to St. Anselm, which bases belief on the statement that 'that must exist than which no greater can be conceived.' It is developed at length in his *Proslogion*. (5) The argument from man's moral sense; and (6) the argument from design in hist. Aquinas elaborated (2) and (3) showing God to be first mover, first efficient cause, the only being ontologically necessary and perfect, and the ultimate designer of a designed universe. From each and all of these attributes he deduced the idea of God as simple, spiritual, unattached Being, infinite and perfect, transcending the created universe. This is still the classic N. T. of the Rom. Cathol. theologians. The argument of S. Anselm is generally discarded.

Nature, name of a Brit. weekly periodical, estab. in Nov. 1869. It aims at placing its readers in touch with the results of scientific claims and discoveries, and urges the claims of science to a more general recognition. Articles on scientific subjects, full accounts of new discoveries, reviews of notable books and papers, and accounts of noteworthy meetings, are included. The paper is pub. by Macmillan.

Nature Printing, name of a process of obtaining plates or engravings by means of impressions taken from the actual objects, and by printing from these impressions. This process can only be used in connection with objects which have flat surfaces, such as lace, and dried plants. The result is obtained by placing the object between two plates, one of copper and another of lead, and by pressing the plates by means of a pair of rollers. The impression thus produced on the leaden plate may be used if only a few copies are needed, but if a large number is required a facsimile of it may be obtained on copper by the electrotype process.

Nature Study, modern revolt against the bookish tendencies of older methods of education. It is encouraged in schools with the object of teaching children to observe for themselves and not to accept common hearsay, with its frequently superstitious associations, as fact. In relation to the modern attempts to repopulate the countryside, N. S. is of the very first importance, especially in the country schools. The practical application of N. S. in schools by gardening, and by the keeping of small live-stock, such as poultry and bees, has in recent years made rapid progress.

Nature Worship, worship which is given to any of the powers or objects of nature and which assumes various forms. In most cases the powers of nature are personified, and the spirit which is regarded as belonging to them is the object of adoration. Among the objects which are worshipped may be mentioned stones of various sizes and forms, trees which were either supposed to be the deity or the dwelling-place of his spirit, animals which are worshipped in some cases because they are supposed to contain the spirit of a

departed friend or relation, and in others because they are of use. The sun and moon were worshipped by some early tribes, as were also the stars, and they still remain deities among some races. The worship of rivers, water, and of mts. has been practised in various countries at different times and in different ways, sometimes the thing itself being the object of worship and sometimes a spirit embodied in it. See also ANIMISM; MOON; SUN WORSHIP; ZOROASTRIANISM. See Sir J. G. Frazer, *The Golden Bough* (3rd ed.), 1907-15, and *The Worship of Nature*, vol. I., 1926.

Naucratis, name of a Gk. trading settlement in Egypt, which was situated between Cairo and Alexandria, near the modern Nebreh. The settlement was probably founded by Milesian colonists about the seventh century B.C., and was noted for its flowers and pottery. The site was discovered in 1884, and the ruins include those of temples, buildings, etc.

Naudé, Gabriel (1600-53), Fr. scholar and librarian, b. in Paris. He studied medicine at Paris and Padua, and was physician to Louis XIII. In 1628 he took charge of Cardinal Bagnio's library, and in 1641 was librarian to Cardinal Arberghini and later to Queen Christina of Sweden. His book *Adels pour dresser une bibliothèque* (2nd ed., 1644) was the first to consider the methodical arrangement of a library. In 1633 he was requested by Mazarin to come and help him to re-form his library, which N. had helped to collect, and was on his way when he died at Abbeville.

Nauen, tn. of Brandenburg, Germany, 20 m. N.E. of Brandenburg. Pop. 9000.

Naugatuck, bor. of Connecticut, U.S.A., in New Haven co., 27 m. N.E. of Bridgeport. One of the world's largest rubber regeneration plants is here, and other manufs. include chemicals, glass, plastics, and aeroplane instruments. Pop. 15,300.

Nauheim, or Bad Nauheim, tn. of Hesse, formerly in the grand-duchy of Hesse-Darmstadt, Germany, 24 m. N.N.E. of Frankfort-on-Main. It is a noted health resort and possesses thermal saline springs with a temp. of from 81 to 95 F. Pop. 12,900.

Naumachia (Gk. ναυμάχια, from ναῦς, a ship, and μάχη, a battle), the name which the Romans gave to the mimic sea-fights which were waged as a spectacle, and also to the scenes of the combats. The latter took place sometimes in the Circus Maximus, water being introduced sufficient to float ships. The first N. on record represented an engagement between the Tyrian and Egyptian fleets, and was given by Julius Caesar in 46 B.C. in the Campus Martius. The custom of exhibiting naumachiae was not confined to Rome, as we find arrangements for flooding the amphitheatres at Capua and Nimes. The combatants fought as in the gladiatorial games, no quarter being given; gladiators or condemned criminals were employed.

Naumburg, tn. of Saxony, Germany, on the Saale, 24 m. S.W. of Halle, with a considerable wine trade, and manufs. of

beer, vinegar, chemicals, cotton, and woollen goods, etc. The most important building is the cathedral of St. Peter and Paul (1207-42). Pop. 26,000.

Naunton, Sir Robert (1563-1635), Eng. author and statesman, noted for his book *Fragmenta Regalia, or Observations on the Late Q. Elizabeth, her times and favorites* (1641), which was revised by Sir W. Scott in 1808, who added N.'s memoirs to the ed. J. Caulfield also ed. this book in 1814. In 1601 N. was elected public orator at Cambridge Univ. He attracted the notice of James I., who appointed him master of requests (1603). After holding other political offices, he was appointed secretary of state (1618). See life by J. Caulfield, 1811 (?) .

Nauplion, small fort. tn. and seaport, cap. of Argolis, Greece, at the N. extremity of the gulf of Argos of Nauplia, and 7 m. S.E. of the tn. of Argos. In the thirteenth century it was occupied by the Venetians, and was taken by the Turks in 1540. From 1824 to 1835 it was the cap. of Greece. The roadstead is one of the best in Greece, having deep water, good shelter, and the protection of two fortresses. Pop. 7000.

Nauplius, king of Euboea and father of Palamedes. To avenge the death of his son, whom the Gks. had put to death during the siege of Troy, he watched for the return of the Gks., and as they approached the coast of Euboea he lighted torches on the dangerous promontory of Caphareus. The sailors, thus misguided, suffered shipwreck.

Nauplius, unsegmented larvae of the lower crustacea with a single frontal eye. See CRUSTACEA.

Nauru Island, is. in the Pacific Ocean, situated in 16° E. long. and 26° S. lat., administered under mandate by Great Britain, Australia, and New Zealand. Area 8 sq. mi. Pop. 2700, of whom 200 are Europeans. In Nov. 1947 the United Nations general assembly brought N. I. within the United Nations trusteeship system, with the govs. of Australia, New Zealand, and the United Kingdom as joint administering authority. Valuable phosphate deposits were discovered in 1900 and developed by the Pacific Phosphate Company. In 1919 these interests were bought up by the mandatory govs. The revenue in 1938 was £30,000. The is. was bombed by Jap. planes on Dec. 10 and 12, 1941, and occupied in Aug. 1942, until the Japs. surrendered in Sept. 1945.

Nausart, see NO-SARL.

Nausea, sense of sickness at the stomach, a desire to vomit. The word is derived from a ship, and is therefore especially associated with sea-sickness. The condition is, however, brought about by many varied affections of the nerves and digestive organs, and is a symptom of many diseases.

Nausicaa, beautiful daughter of Alcinous, king of the Phaeacians, and his queen Arete; was noted for her simplicity, modesty, and gentleness. One day when she was playing ball on the shore with her maidens, the shipwrecked Ulysses suddenly appeared, striking terror into all

but N., who took him to the court of her father. See Homer's *Odyssey*, vi.; and J. A. Symonds, *The Greek Poets*, vol. i., 133-137, 1873-76.

Nauth Girl (Hindu *nach*, dance), Indian professional dancing girl. Many are attached to temples where they perform sacred dances in bejewelled dresses; others are hired to entertain guests at private secular dances i.e. nautches in the strict sense. Moslem N. Gs. perform only in secular dances, as on the festival evening of Rāmādān. The dance consists of posturing and slow steps, each part of the body being used to express emotion.

'**Nautical Almanac**', gives the spherical co-ordinates of the sun, moon, planets, chief stars, and also the rectangular co-ordinates of the sun, for every day of the year (those of the stars change so little that ten-day intervals suffice), times of occultations of sunrise and sunset, moonrise and moonset, of eclipses, and scores of other matters essential to the astronomer. It is pub. annually at least a year in advance and collaboration between the N. A. office and other similar institutions in different countries is essential, owing to the magnitude of the work involved in making the necessary calculations. It was first produced in 1766 for 1767, and continued the responsibility of the Astronomer Royal (although the work was supervised by a superintendent known as the 'comparer') until 1832 when it was pub. by order of the Board of Admiralty.

Nautical Surveying, see under SURVEYING AND LEVELLING.

Nautilus, name given to two distinct Cephalopods, but the pearly N. is generally indicated, the paper N. being referred to the quite distinct genus *Argonauta*. The genus N. inhabits the Indo-Pacific Ocean,

a number of small retractile feelers instead of arms with suckers and hooks, and in having an external chambered shell. The shell is pearly within, and has a regularly convoluted form, the last whorl being equal to all the others. The chambers or cells are perforated towards the centre and connected by a slender tube or siphon which probably makes the progress of the shell muscle. The number of partitions in the cell indicates the periods of growth, a new outer chamber being added as the capacity of the previous one is outgrown. The total number of compartments is often about thirty. Externally the shell is covered with a calcareous layer and is brown in colour and marked by dark bands 'like a tortoiseshell cat.' The shell yields a fine mother-of-pearl, which is used for inlaying. The N. frequents the sea bottoms, where, with its foot, it can make fairly rapid progress. It lives chiefly on molluscs and small crustaceans, and is sometimes taken in lobster pots and hoop nets. Like other members of its class, it occasionally swims backwards on the surface by propelling spouts from the siphon, the head and tentacles being projected out of the shell; but the rise is probably involuntary and caused by storms. The animal appears to be much exposed to the attacks of various enemies, having no operculum, and being but feebly attached to the shell, and it is the only Cephalopod which lacks the power of discharging an ink-like fluid to darken the water to escape from its enemies. On the Nicobar coast of India its flesh is salted and dried.

Navajoes, or **Navahoes**, are N. Amer. aborigines, forming the most important tribe of the S. div. of the Athabascan stock of the N. Amer. Indians. The remnants of the tribe are located in the Navajo reservation, New Mexico and Arizona, and number about 20,000. See Dr. W. Matthews, *Navaho Legends*, 1887, and C. K. Khurn and D. Leighton, *The Navaho*, 1917.

Naval Air Arm, title given in 1946 to the air component of the R. N., previously known as the Fleet Air Arm (q.v.). The N.A.A., or naval aviation, comprises from one-quarter to one-third of the total strength of the R.N.

Naval and Military Scientific Societies. Probably the best known of these is the Royal United Service Institution, with its imposing home in Whitehall. There are among others the Institute of Royal Engineers at Chatham; the Royal Artillery Institution at Woolwich, and the Institution of Naval Architects; the Army Historical Research Society; the Society of Nautical Research; and the Navy Records Society. Most of these bodies issue quarterly magazines: *The Mariner's Mirror*, *The Journal of the Society of Naval Research*, and *The Army Historical Research Magazine* (estab. soon after the First World War) are all well-known publications which deal with naval and military subjects of current or historical interest. The Navy Records Society has no periodical, but issues rare and hitherto unpublished records of



NAUTILUS POMPILIUS

A, swimming; B, shell in section; C, crawling.

and differs from all other living Cephalopods in having four gills instead of two, whence it is placed in a separate order (*Tetrabranchia*) of its class. Of over thirty genera of that order it is the only surviving genus. It differs, too, in having

the navy in vol. form, dealing with special events or important persons.

Naval Cadet, see NAVAL EDUCATION
Naval Colleges, Royal, see NAVAL EDUCATION.

Naval Discipline Act define the offences and procedure of naval law. The first comprehensive code was drawn up by command of Richard Coeur de Lion in 1194 after his return from the third crusade. This code was known as the Naval Laws of Oleron from the is. in which the code was drawn up and sealed. It became the virtual basis of the sea laws of 1530 drawn up by order of King Henry VIII., of which naval discipline forms a large part. The Act which is now in force is the Act of 1884, which amended the Act of 1866. This Act defines the constitution of the court-martial which tries naval offences, and regulates its personnel according to the rank of the person charged. The Act also defines the limit of locality for naval law. See COURT-MARTIAL.

Naval Education, for *officers*, is given at: (1) The Royal Naval College, Dartmouth, through which officers are normally admitted to the R.N. Under the new scheme estab. In 1948 there are three entries of cadets each year, at the age of sixteen. Special entry cadets, at a later age are also admitted and remain at Dartmouth for four months instead of two years. Subsequently all cadets spend eight months in a training cruiser before joining the fleet as midshipmen. Competitive examinations, held near the candidate's own school, make an initial selection, and admissions are finally decided by a full day's test of character, aptitude, and intelligence. Fees have been abolished, and there is free board and lodging, parents paying for uniform and personal expenses according to their means. (2) The Royal Naval Engineering College, Keyham, for officers specialising in engineering. A course lasts four years and midshipmen join the college on completion of their cadet training. New classes join in Jan. and Sept. each year and training qualifies officers for service afloat in the engineering branch. (3) At sea by instructor and technical officers. (4) The Technical Schools of Gunnery, Torpedo, Navigation, etc., at Portsmouth, and, to a smaller extent, at other dockyard ports, where all executive sub-lieutenants must qualify for Lieutenant. Technical schools also provide courses for specialists and other officers. (5) The Royal Naval College, Greenwich, estab. in 1873 for the education of naval officers. Also includes the Naval Staff College, the Naval War College, the School of Naval Architects, and Women's Royal Naval Service Officers' Training Corps. Instruction is given to naval and marine officers in all branches at all stages of their career from sub-lieutenant to captain R.N., in theoretical and scientific study bearing on their profession. The Royal Naval College is commanded by a vice-admiral (president) assisted by an administrative and professorial staff. The president also has direct control of

the Naval War College where, with a captain R.N. as deputy, senior officers study the higher strategy of war. The Naval Staff College is commanded by a captain R.N. (director). Officers from the army and R.A.F. also attend the Naval Staff and War Colleges. (6) Other estabs. such as the Tactical, Joint Anti-Submarine, Signal Schools, Royal Naval Air Stations, etc. All R.N. educational estabs. are open to officers of the dominion navies and those of India and Pakistan. Officers of foreign navies may also attend for special courses. For men and boys at boys' training estabs. such as H.M.S.



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THE ROYAL NAVAL COLLEGE, DARTMOUTH

Royal Naval Official Photograph.

Ganges (Shotley), H.M.S. *St. Vincent* (Gosport), at R.N. barracks, in the training squadron, and at technical schools. At sea, general education is carried out by instructor officers and schoolmasters. R.N. vocational training to give men an opportunity to improve their prospects of employment on return to civil life is carried out mainly by lectures at the naval depots and at municipal training colleges, etc.

Naval Expenditure. The real beginning of the expenditure of a fair proportion of the public funds on the upkeep of the navy dates back to the time of Cromwell.

Previous to that time the navy, such as it was, had been supported chiefly by special grants and by ship money, a tax which is supposed to date back to the time of Alfred the Great. By 1688 N. E. had reached the sum of nearly £1,000,000 per annum, but during the eighteenth century, when we were struggling for colonial supremacy, the personnel of the navy and the cost of the upkeep went up by leaps and bounds. Under the administration of the elder Pitt, the expenditure per annum reached £5,500,000, and during the Amer. War of Independence the personnel of the navy reached practically 100,000 men, and the expenditure was wellnigh £9,000,000 per annum. By the end of the Napoleonic war (1815) the expenditure had reached the colossal figure of £23,500,000. During the peace years which followed it remained evenly at about £7,500,000; this naturally increased during the Crimean war, when the figure again crept up to about £20,000,000. In the financial year ending March 1914 the total amount voted for the navy was £45,075,000. The ratio-agreement and limit of size of capital ships prescribed by the Washington Treaty of 1922 (*q.v.*) prevented the race in armaments for many years and kept expenditure within tolerable bounds, and at the end of the first decade and a half after the First World War the total figure did not much exceed £50,000,000, increases being mainly for replacements and modernisation, always within the treaty limits. Further limitations on design agreed on by the London Conference of 1930 imposed some check on expenditure, while, under the London Treaty of 1936, qualitative development of all the major navies was regulated, and the old Washington limit on capital ships retained. Thus in 1935-1936 expenditure was only £69,050,000, a low figure in view of the fact that Germany was now free to build up to a higher ratio to Brit. construction and that scientific development in armaments involved ever-increasing expense. But the chief factor in enhancing Brit. N. E. was the refusal of both Japan and Germany any longer to be bound by any treaty limitations whatever after the expiration of the Washington and London Treaties in 1936. Hence in the financial year 1937-38 the figure for N. E. rose to £95,196,000, the increase being mainly in respect of three new battleships, and some eighty other new ships, all, however, being constructed within the qualitative limits of the treaty of London of 1936. In 1938-39 the total was £113,810,000 and, in view of the menacing international situation, Great Britain contemplated adopting the 'escalator' clause (allowing building over the 35,000-ton limit) of the London Treaty, owing particularly to Jap. construction. In the year 1939-40 the figure rose to £149,399,000, fifty ships being added in the previous year and sixty more in the year 1939, all this construction being directed against Germany. In 1940-41 the total amount of N. E. rose sharply to £384,162,000, construction being limited only by the building capacity of the shipbuilding yards.

This figure continued to rise and in 1943-1944 reached £690,563,761. On conclusion of the Second World War it naturally fell, and in 1948-49 dropped to £153,000,000. In the following year, however, it began to rise again to £189,250,000, due mainly to improvements in naval and civilian emoluments, exhaustion of war stocks, and higher prices. With prices still rising; with the necessity to replace obsolescent equipment and to meet the advance of science by supplying the fleet with the latest devices (all more complicated and expensive) it is unlikely that N. E. will drop in the foreseeable future.

Naval Literature. The literature which has grown up round so important a subject as the navy has by this time reached immense proportions. We can deal first of all with official literatures, and we find that this side of the subject alone contains such a vast amount of works that it is possible here only to mention the chief headings under which they can be found. 'General regulations' is the title of the first sub-heading, and the literature to be found here deals simply with those regulations which govern the men who belong to the R.N. Special handbooks are issued which deal with special subjects, such, for example, as manuals of gunnery, handbooks for special guns, e.g. *Handbook of the Nordenfeldt 6 Pr. Quick-firing Guns, Marks I. and II.*; *Handbook of Gymnastic Exercises for the Use of His Majesty's Fleet: Signals for the Royal Navy and Ships under Convoy* (1746), one of the more recent books issued on the latter subject being *The Seaman's Signal Manual for the Use of His Majesty's Navy* (1928). Special manuals are also issued dealing with training ships, uniform, watch, station, quarter, and fire bells, reviews and manoeuvres, Royal Marines, R.N. Reserve, and there is, of course, also the periodical pub., the *Navy List*. Practically two columns of the catalogue of the Brit. Museum Library are taken up with lists of addresses and petitions from the R.N., and in glancing through these we find, 'A letter from the commanders and officers of the fleet of this commonwealth unto General Monck in Scotland' (1659), and 'To his Highness the Lord Protector, the humble petition of the seamen belonging to the ships of the commonwealth of England.' Among the miscellaneous literature catalogued in the vol. already mentioned we find *A Brief Inquiry into the present condition of the Royal Navy* (1801), which only goes to prove that a topic which is ever recurring at the present day is by no means new, and also a copy of the oath taken by the seamen of the revolted ships (1648). Most of the pamphlets to be found here deal with some grievance or some supposed fault of the R.N. To turn, however, to the more modern side of the literature of the Brit. R.N., we find that within even the last few years literature has increased at a great rate. Modern general literature with some bearing on the navy includes amongst many other pubs. the following: Count Reventlow. *Die Englische Seemacht*

1906; E. S. Bellasis, *The Fighting Ships and their Work*, 1925; C. H. Brown, *Manual of Seamanship*, 1927; and A. E. Seaton, *Manual of Marine Engineering*, 1928; and for sailing ships, R. and R. C. Anderson, *The Sailing Ship*, 1926. Works dealing with naval hist. include Ford, *Earliest English Navigation and the First Schools of Warfare*, 1906; Kill, *Seemacht in der Ostsee im 17. Jahrhundert* (Kiel, 1907-1908); 'The Elizabethan Naval War with Spain' (in the *Cambridge Modern History*, vol. iii., 1901); 'The Navy of the Commonwealth and the First Dutch War' (*Cambridge Modern History*, vol. iv., 1906); *Naval Operations between Great Britain and America, 1812-15* (Theodore Roosevelt); Pepys's *Memoirs of the Royal Navy*, 1679-88 (ed. by J. R. Tanner, 1906); Adm. Sir H. Richmond, *The Navy in the War of 1739-1748*, 1926; 'The Struggle for the Mediterranean' (*Cambridge Modern History*, vol. viii.), and 'The Armed Neutrality and the Command of the Sea' (*Cambridge Modern History*, vol. ix.), both by H. W. Wilson. Literature dealing with naval science also has been pub.; Sir C. A. G. Bridge, *The Art of Naval Warfare*, 1907; R. Daveley, *A Study of Naval Strategy*, 1909; A. T. Mahan, *Naval Administration and Warfare*, 1908; and Sir H. Richmond, *Naval Warfare*, 1930, and *The Economy of Naval Security*, 1931; and on special topics we find a literature on such subjects as, A. Stenzel, *Submarine Navigation and Warfare*; *Naval Art*; *Deutsches seemannsrechtisches Wörterbuch* (Berlin), 1904; A. Pearce-Higgins, *Defensively Armed Merchant Ships*, 1917, and *The Right of Visit and Search*, 1927; C. J. Columbus, *A Treatise in the Law of Prize*, 1926; H. A. Smith, *The Modern Development of the Laws of Naval War*, 1929. Other books which may be mentioned in this class are A. T. Mahan, *Influence of Sea Power upon History*, 1890, *Influence of Sea Power upon the French Revolution and Empire*, 1892, and *Sea Power as Related to the War of 1812*, 1905; J. A. Froude, *English Seamen of the 16th Century*, 1895; and Sir H. Richmond, *Sea Power in the Modern World*, 1934, and *The Navy*, 1938.

Compared with army literature the First World War did not produce a large amount of N. L., but mention must be made of J. S. Corbett and H. Newbolt, *Naval Operations (1914-18)*, 1920-23; C. E. Fayle, *Seaborne Trade*, 1920-24; A. Hurd, *The Merchant Navy*, 1921-24; T. G. Frothingham, *The Naval History of the World War*, 1924; and the official dispatches of the battle of Jutland. On this battle a narrative poem, correct in its naval details, has been constructed by Shane Leslie (1931). Among N. L. of the Second World War are included Capt. R. Grenfell, *The Bismarck Episode*, 1943; Capt. Taprell-Dorling ('Taffrail'), *Western Mediterranean*, 1942-45, 1947; W. E. Benyon-Tinker, *Dust upon the Sea*, 1947; Capt. J. Cowie, *Mines, Minelayers, and Mine-laying*, 1949; Comdr. G. Stitt, *H.M.S. Widewake*, 1943, and *Under Cunningham's Command*, 1944; and Comdr. R. Wenys, *Walker's Groups in the Western Approaches*, 1948.

An important side of N. L. is that which deals with the biographies of famous seamen. Amongst the more important of this class may be mentioned: J. Charnock, *Biographia naralis*, 1794-98; R. Southey, *Nelson*, 1813; J. Corbett, *Memoirs of Paul Jones*, 1830, *Drake*, 1890, and *Drake and the Tudor Navy*, 1898; E. Brenton, *St. Vincent*, 1838; J. Ross, *Sauvarez*, 1838; E. Edwards, *Raleigh*, 1868; F. Jones, *Frobisher*, 1878; C. Fitzgerald, *Naval Biographical Dictionary*, 1861, and *Tryon*, 1897; D. Haunay, *Blake*, 1886, and *Rodney*, 1890; A. T. Mahan, *Nelson*, 1899; and H. Keppel, *A Sailor's Life under Four Sovereigns*, 1899. As far as naval fiction is concerned we may mention merely T. Smollett, *Roderick Random*, 1748; Fenimore Cooper in the *Pilot*, 1823, and the *Two Admirals*, 1842; Capt. Marryat in *Frank Mildmay*, 1829, *Peter Simple*, 1834, and *Mr. Midshipman Easy*, 1836; E. Howard in *Rattlin the Reefer*, 1836; 'Q' in the *Blue Parrot*, 1903; C. S. Forester, *The Ship*, 1943, and the stories of Paymaster Commander L. A. da C. Riooli (Bartimeus). Amongst personal reminiscences are notable: *Pepys's Diary*, 1660-78; M. Tanbman, *Diary of a Captain*, 1710; W. Dampier, *Voyages*, 1779, and *Cook's Voyages*, 1893; Lord Byron, *Journals of a Voyage Round the World*, 1821; S. Osborn, *Stray Leaves from an Arctic Journal*, 1832; C. Darwin, *Voyage of the 'Beagle'*, 1852, and *Journal of H.M.S. 'Beagle'* in 1831-36, 1890; and Hobart Pasha, *Sketches from My Life*, 1886.

Naval Manoeuvres, see STRATEGY AND TACTICS, and under NAVY AND NAVIES.

Naval Operations in Second World War. *Blockade of Germany*.—The naval side of the war was opened by the Ger. sinking by torpedo the 13,000-ton Atlantic liner, *Athenia*, on Sept. 3, 1939. This was the first Ger. submarine attack on the high seas and the ship, which was carrying 1400 passengers, was sunk without warning about 250 m. W. of Donegal. Most of the passengers were picked up by Brit. destroyers, but 128 persons lost their lives. The Ger. Gov. promptly announced that the Brit. Admiralty had sunk the boat in order to vilify Germany, a grotesque travesty which was not even characterised by the customary, if superficial, cunning of the Ger. propaganda machine. As soon as war broke out the Brit. Gov. indefinitely suspended all their obligations under the London Naval Treaty, 1936, and the agreements of 1937 with the U.S.S.R., thereby giving Britain a free hand in building ships of any tonnage and armament whatsoever. The blockade of Germany was begun at once, though the war was well advanced before some of the more glaring loopholes in the blockade were circumvented. While Italy remained neutral great quantities of oil and other essential commodities found their way through that country into Germany, while, again, until Ger. exports were stopped, as a reprisal for the laying of magnetic mines, the blockade was defective in that it allowed Germany to exploit in that it allowed Germany to exploit the various terrified 'neutrals.' Ger. merchant ships were soon being

steadily driven from the seas in spite of the use of every artifice and every expedient of concealment to avoid capture. At the outbreak the total tonnage of Ger. ships at sea or in neutral or allied ports (excepting the Baltic) was about 1,105,000 tons. Practically all that shipping had been cleared off the seas by the second week of the war. Some were captured, some scuttled, and much of it interned. It was at once evident that Germany was prosecuting an unrestricted submarine campaign as violent as that on which her navy embarked in 1917, and that her submarine commanders had been given orders to sink all ships at sight and without warning. As time went on it became obvious that Germany's only hope of counteracting Britain's command of the seas was to sink, by fair means or foul, as great a total tonnage as possible. Early in the war not only a certain measure of success attended the R.N.'s operations against enemy submarines and it was fortunate that the menace did not at first approach the magnitude it assumed in the First World War. In Nov. 1939, after much mysterious talk about using 'a terrible secret weapon,' Germany tried the device of sowing the seas with magnetic mines dropped from aeroplanes or laid by submarine. But very soon one of these mines fell on swampy land on the E. coast so that its secrets were disclosed, with the result that ships were fitted with a defensive device called the 'degaussing' girdle (the gauss is a unit of magnetic flux) which had the effect of demagnetising or depolarising the ship. (The girdle ran round the hull with an electric current passing through it, the effect being to demagnetise the field through which the ship passed.) No less than 120,000 tons of Brit. merchant shipping were lost in the first fortnight of the war, while only 30,000 were lost in the second fortnight. In the ensuing period, the total varied considerably, rising perhaps to as much as 70,000 tons Brit. and neutral. It was impossible, very early in the war, to apply the convoy system while so many of the ships were afloat on the high seas, but when it was applied its results were no less decisive than in the First World War. But however well devised and applied, these and other counteractive measures could hardly prevent occasional very serious losses at the hands of a powerful, determined, and resourceful foe.

Loss of 'Courageous' and 'Royal Oak.'—On Sept. 17, 1939, the aircraft carrier *Courageous* (22,500 tons) was torpedoed and sunk, and of the total complement of 1202 officers and men, 515 lives were lost, including the commander. The *Courageous* was originally completed as a cruiser in 1917, but was converted into an aircraft carrier between 1924 and 1928 and refitted in 1936. She was attended by four destroyers, but at the time two of these had to go and hunt a U-boat which was attacking a merchant ship, and when the aircraft carrier turned into the wind at dusk to enable her aircraft to land on her deck, she happened by an extraordinary chance to meet another U-boat.

Grand-Adm. Raeder at about this time stated that if Brit. merchantmen were armed this would provoke counter-measures; but Mr. Churchill, then First Lord of the Admiralty, retorted that very soon the whole mercantile marine of the empire would be armed and, as time was to prove, their crews repeatedly defended themselves with success, often bringing down attacking seaplanes or bombers. Despite the menace from the air, vastly more developed than in the previous war, the navy's command of the seas enabled some 158,000 Brit. soldiers to be transported to France within five weeks from the outbreak of war—as compared with 148,000 men in six weeks in the First World War. More devious routes were taken than in 1914 and again the ships had to carry a much greater load of guns, tanks, and mechanised material. Early in Oct., there was considerable intensification of the U-boat campaign against Scandinavian shipping and it was evident that the Ger. Gov. were not to be deterred by any considerations of neutrality where it was to their advantage to ignore them; and, at this time, the Ger. Gov. also announced that as Ger. submarines had been attacked by Brit. merchant ships every vessel of the Brit. mercantile navy would be regarded as a warship. This was a change of policy and was soon followed by the sinking of freighters off the coast of Brazil by an armed raider—probably the *Graf Spee* whose operations off the S. Amer. coast had been reported by the naval authorities at Durban. Ger. bombing from the air was not very effective. Thus on Oct. 8 there were repeated actions in the North Sea between enemy planes and Brit. cruisers and destroyers, but no Brit. ship was hit, and indeed, by good manœuvring, the ships could generally avoid a direct hit. The most serious loss sustained by the navy in the early days of the war was that of the *Royal Oak* on Oct. 14, in Scapa Flow, a few hours after two U-boats had been destroyed by depth charges S. of Ireland. The *Royal Oak*, a battleship of the *Royal Sovereign* class (29,150 tons), laid down in 1914, had recently undergone extensive repairs and had only been recommissioned in June 1939. Of her normal complement of 17 officers and 1153 men, 24 officers and 809 men were killed, the much lower proportion of ratings being due partly to the fact that many could not swim, and also because large numbers thought, when the first of many torpedoes was discharged, that the attack was from the air and took up their air-raid stations under armour. It having been revealed that the anchorage was not proof against the attack of a U-boat on the surface or half submerged at high water, steps were at once taken to obviate a recurrence. In the whole course of the First World War the anchorage at Scapa Flow was immune from U-boat attacks on account of the obstacles imposed by currents and the net barrages, and entry by a U-boat was therefore a 'remarkable exploit of professional skill and daring' (Mr. Churchill).

German War on Neutrals.—The list of

sunken cargo vessels was always a long one and the circumstances in which ships were torpedoed were not seldom the theme of bitter comment by neutral ministers who still seemed to labour under the impression that the Ger. Gov. would observe the accepted code of international usage. Thus there was an outcry in the U.S.A. on the Ger. seizure, on Oct. 15, 1939, of the Amer. *City of Flint* (5000 tons), carrying conditional contraband, in the Atlantic by the pocket battleship *Deutschland*, whose captain put a prize crew on board which took her to Murmansk. Later the vessel was released by the Soviet Gov., flying the swastika and was sighted by Brit. naval forces in Norwegian territorial waters. Fearful of Brit. action the Norwegians then interned the Ger. crew and restored the ship to her own crew. As regards the Brit. mercantile losses through the U-boat campaign, while no more than 14 per cent of Brit. tonnage which was afloat at the beginning of the war had been lost at the end of a couple of months, the corresponding figure for the Ger. submarine service was 30 per cent. Moreover, by rebuilding, the net gain to the Brit. tonnage was considerable. Furthermore over 10,000,000 tons of cargo were brought into Britain in the first eight weeks of war and less than 250,000 lost; but over 40,000 tons consigned to Germany had been captured. With the object of expediting the passage of neutral cargoes it was decided to re-introduce the system of 'navicerts' as in the First World War (see further under ECONOMIC WARFARE, MINISTRY OF). Much concern was shown by neutrals at the time by the decision of the allied govs. to seize Ger. exports as a reprisal for the barbarous use of magnetic and unmoored mines, but the only comment that might seem obvious is that this form of reprisals should have been taken at the beginning of the war, it being evident that the status of a 'neutral' meant nothing to Germany, practically every state in Europe being marked out for ultimate exploitation or invasion by the common enemy. Another severe loss occurred on Nov. 23, 1939, when the armed merchant cruiser *Rauhlpindi* (16,687 tons) was sunk off Iceland. She was part of the N. patrol by which the contraband control of Ger. trade was enforced. In the face of overwhelming odds she engaged the Ger. battleship *Deutschland*, which was accompanied by another warship, maintaining the fight with her 6-in. guns until the whole ship was ablaze and sank with her flag flying, 39 officers and 226 men being lost. At this time two Ger. pocket battleships and probably one other cruiser were at large in the N. and S. Atlantic or near Madagascar. But already the Brit. Gov. had nearly 1,000,000 tons of warships of all classes under construction and the number of hunting craft in home waters was trebled between Aug. 31 and Nov. 30 and was still being augmented.

Battle of the Plate River—'Altmark' Affair.—The most dramatic event at sea was now in process of enactment, when the Ger. pocket battleship *Admiral Graf*

Spee, which had been operating in the Atlantic Ocean as a commerce raider since the outbreak, was intercepted and attacked on Dec. 13 by the Brit. cruisers *Erebus* (8300 tons), *Achilles* (New Zealand ship, 7000 tons), and *Ajax* (7000 tons) off the coast of Uruguay, and, after a running fight lasting 14 hrs., was driven into the port of Monte Video, severely battered, with 36 of her crew dead and 60 wounded. The battleship, which was completed in 1936, was armed with six 11-in. guns and eight 5·9-in. guns, while her armament was superior to the combined power of all three Brit. cruisers, whose heaviest guns were only 8 in. The Brit. ships showed superior speed and manoeuvring and by using smoke screens boldly brought the enemy ship within range of their guns. The *Erebus* dropped out of the battle after suffering a number of hits, and proceeded to the Falklands for repair, while *Ajax* and *Achilles* kept up the pursuit. With unconcealed satisfaction the world learned shortly afterwards that the *Graf Spee*, after endeavouring by one excuse or another to remain in Monte Video, was forced out of the harbour. Her captain, Langsdorff, was faced with the choice of submitting to internment or coming out to resume the fight with the Brit. cruisers which were watching outside the harbour for her. She came out, but not to fight; for she was scuttled in the fairway by her captain, who then took his own life. Yet all that awaited the battleship were *Ajax* and *Achilles* and the 8-in. cruiser *Cumberland*, which last-named had arrived to take the place of the damaged *Erebus*. The Ger. ship had on board sixty-two survivors of nine Brit. merchant ships which had been previously sunk by her. These prisoners were released after the ship had put in at Monte Video, having been cooped up in the ship during the battle. The *Erebus*, which had led the attack, suffered a loss of 64 killed and 21 wounded and at the end only one 8-in. gun remained in action and that could only be fired by hand. The whole action was worthy to rank with the finest exploits of the R.N. and Henry Harwood, the commander of the squadron, was knighted and promoted to rear-admiral. The wreck of the *Graf Spee* was eventually sold to a Uruguayan dealer for £10,000. Over 300 other Brit. seamen, made prisoner from vessels sunk by the battleship before her destruction, were all this time aboard the Ger. vessel *Altmark*, which had been armed as an auxiliary ship. This ship had succeeded in escaping across the Atlantic and reaching the protection of Norwegian territorial waters, which her captain proposed to use in order to convey the Brit. prisoners in triumph to Germany. But Brit. aircraft located the *Altmark* on Feb. 15, 1940, and she was intercepted by the Brit. destroyer *Intrepid* after having entered Jösing Fjord in the hope of evading the Brit. warships. Orders were given by the Brit. Admiralty to enter neutral waters, search for the *Altmark*, and rescue any prisoners on board. Two Norwegian gunboats were at the mouth of the fjord. The captain in command of

H.M.S. *Cossack* offered to place a joint Brit.-Norwegian guard on the *Allmark* and to escort her to Bergen for an investigation according to international law. The offer was declined by the Norwegians, who stated falsely that the *Allmark* was unarmed and that nothing was known of any prisoners on board. On these assurances the Brit. destroyers withdrew; but, after dark, on receipt of further Admiralty orders, the *Cossack* re-entered the fjord. The gunboats still refused to co-operate. The *Allmark* then tried to ram the *Cossack*, but ran aground and was boarded from the destroyer. After a short fight in which sev. Gers. were

some twenty-eight had been sunk, the number being balanced by the acquisition of new boats. The hundreds of other small craft, which supplemented the destroyers, were boats converted from civilian use and were all armed with 'Asdies' (anti-submarine device), the depth charge, and the gun. The U-boat was being steadily driven from using the gun upon the surface to more ruthless but less effective warfare by torpedo and it had been largely driven from that by mine-laying. The Gers. broke every rule accepted by the world for regulating mine warfare. Besides this they committed outrages upon fishing



THE END OF THE 'ADMIRAL GRAF SPEE'

killed or wounded, the *Allmark* was over-powered and the Brit. prisoners, numbering 299, discovered and released, part of the Ger. boat's crew surrendering while others fled across the ice to the shore. This must be one of the most dramatic rescues in the hist. of sea warfare. The unfortunate prisoners had been confined below and battened down ever since the battle of Dec. 13 and had been subjected to brutal treatment by the *Allmark*'s notorious captain.

German Illegilities.—By the end of 1939 the Gers. had lost nine out of the fifty-seven U-boats with which they started the war, and probably less than ten fresh submarines came into action in that period. Thus the enemy probably ended the year with about fifty-eight U-boats, of which twenty were required for training, and the number operating at any one time possibly did not exceed ten. Allied losses were substantial, and great preparations were made to cope with the full scale of attack which was to come later. Britain began the war with a very modest number of destroyers, and by the middle of 1940

fleets, small unarmed merchant vessels, and upon lightships, and in order to counteract these methods thousands of guns were issued to the Brit. merchant and fishing fleets. Neutrals accepted the Ger. illegalities and atrocities as part of the ordinary day-to-day conditions of war, and so terrified were they of Ger. attacks, which spelt the doom of hundreds of their sailors, that they generally ignored Brit. advice to take counter-measures and would agree to Germany being allowed to gain one set of advantages by breaking all the rules and to insist, when it suited her purpose, upon the strictest interpretation of the international code she had torn to pieces. It was therefore hardly surprising that the Brit. Gov. preferred to interpret all conventions by the light of humanity rather than of legal pedantry. Early in 1940 a number of Ger. merchant vessels tried to escape from neutral ports, but were either seized by Brit. ships or followed the customary Ger. policy of scuttling themselves, relying on Brit. gallantry to save their crews.

German Losses in Norwegian Waters.—In April 1940 the Ger. sustained heavy losses during the invasion of Norway, whose territorial waters their warships and merchantmen, or troraphips disguised as merchantmen, were using with impunity. Hence the Brit. Gov. laid mines in these waters, but when the actual invasion of Norway followed, the Brit. fleet had already been decoyed northward to Narvik while the Ger. troraphips and troop-carrying planes crossed the Skagerrak and landed the invading forces. Earlier in these operations off Norway the Brit. destroyer *Glow-worm* was lost in N. waters through leaving the main body of destroyers to pick up a man lost overboard. The flagship *Rodney* was hit (April 9) by a heavy bomb, but her strong armour resisted the impact; while the cruiser *Jurassic* successfully sustained an attack by five successive waves of bombers. Off Narvik (April 9) the *Renown* sighted, amid snowstorms, the *Scharnhorst* in the dim distance and opened fire. She hit the Ger. ship's forward structure at 18,000 yds. range, but the *Hipper* threw a smoke screen across the tracks of the *Scharnhorst* and she escaped. Five Brit. destroyers under Capt. Warburton-Lee (awarded the V.C. posthumously) on the same day gained a victory at Narvik over a number of Ger. destroyers, sinking three. It was a fight worthy of any in the annals of the Brit. Navy. The Ger. Navy, as a result of the operations between April 7 and 11, lost four cruisers or one-half their pre-war strength in this class of ship, a number of destroyers, sev. U-boats, and numerous store-ships and transports. Again, at Narvik, two days after Warburton-Lee's action, the *Waspire*, accompanied by a strong force of destroyers, and led by Vice-Adm. Whitworth, advanced up Narvik Fjord and sank four Ger. destroyers in Narvik Bay. Three others, which fled up a narrow inlet behind Narvik tn., were pursued and also destroyed. It was evident that in order to achieve the conquest of Norway the Ger. were prepared to gamble with their navy. It is equally evident that had the Brit. Gov. realised that the invasion of Norway was intended, the R.N. might have sunk most of the rest of the Ger. Navy in the S. waters of Scandinavia. The Ger. invasion having proved entirely successful, the Allies laid a new minefield in the Kattegat and Baltic, so as to complete the blocking of all Germany's coast-line both in the North Sea and the Baltic as well as that of Dan. and Norwegian waters. On April 11 the pocket battleship *Admiral Scheer* was torpedoed by a Brit. submarine but evidently not sunk. In the succeeding days Brit. submarines sank numerous Ger. supply ships and transports, notably off Narvik. In all the three weeks from April 7 to April 20 there was intense naval activity in these waters, as is indicated by the losses on both sides. The Ger. had 2 capital ships damaged, 3 and possibly 4 cruisers sunk, as well as the 7 destroyers lost in the Narvik actions, 30 transports and store-ships sunk, scuttled,

or set on fire, with the loss of thousands of lives, and another 10 transports or store-ships were struck by torpedo and probably sunk. The R.N. lost 4 destroyers, 3 submarines, 1 sloop, and 5 trawlers; 5 other warships were damaged by air attack and 1 store ship was sunk by a U-boat. From these figures it will be seen that the strength and efficiency of the R.N. were but little affected, but the damage to the Ger. Navy was so substantial as to alter the balance of naval power and to permit an important redistribution of the main allied fleets—a most valuable result in view of the fact that Italy was soon to declare war against the Allies. But it is not to be gainsaid that the Brit. Navy continued to suffer heavy losses in Norwegian waters in early May when convoying allied troop transports from Norway, these losses including sev. more destroyers, though, against this, must be set many Brit. submarine successes (see further under NORWAY AND DENMARK, GERMAN INVASION OF 1940).

In this period occurred the invasion of Holland when the bulk of the Dutch Navy, serving in European waters, succeeded in making their way to Brit. ports—like the Polish ships—to co-operate with the R.N. for the remainder of the war. These included five cruisers and a considerable destroyer and submarine force. During the invasion of Brit. motor-torpedo boats went to keep watch on the Zuider Zee while the oil tanks were fired and to cover the evacuation of refugees, including Queen Wilhelmina and the Dutel royal family. The next exploit, in order of time, of the R.N. was the co-operation of the fleet with the R.A.F. in the evacuation of the B.E.F. from Dunkirk. (This is fully described under WESTERN FRONT). During the naval operations in connection with the withdrawal of the allied forces from Narvik, the aircraft carrier *Glorious*, sister ship of the *Courageous*, was lost, together with two 1350-ton destroyers, both the *Scharnhorst* and *Gneisenau* taking part in the action involving their loss. Thirty-eight survivors subsequently reached the Faroes and a few more were taken prisoner by the Ger. By now naval operations had been in progress against the Its. in the Mediterranean and very soon a number of their submarines were sunk by submarines or bombers; but the R.N. found it very difficult to lure the It. fleet from its bases.

British Attack on French Fleet.—By the terms of the Franco-Ger. armistice Fr. naval forces were to be demobilised, and had the Brit. Gov. taken no action the whole of the Fr. Navy would have passed into Ger. and It. hands for use against Britain. The Ger. Gov. solemnly declared that they had no intention of using these ships for their own purposes but the Brit. Gov. had not the slightest reason for believing in any 'solemn assurances' given by Hitler. Already a number of Fr. ships had come into Portsmouth and Plymouth. Under Mr. Churchill's lead the Cabinet soon decided on drastic action.

The fleets in the two ports above mentioned were at once taken under Brit. control. They comprised 2 battleships, 2 light cruisers, some submarines, 8 destroyers, and 200 small mine-sweeping and anti-submarine craft. They were boarded by superior Brit. forces, no resistance being offered, and indeed a considerable number of Fr. sailors elected to continue the war against Germany. But at Alexandria, where lay another Fr. fleet, the situation was more difficult, and it was only after some days that agreement was reached to demilitarise the ships. Had the Fr. commander disagreed his ships would have been sunk. Things were still more critical at Oran in N. Africa where lay a large Fr. fleet, including the finest of their battleships. At Oran and Mers el Kebir were the *Dunkerque* and *Strasbourg*—two of the most modern battleships of the world—two other battleships, including the *Bretagne*, seven light cruisers and a number of destroyers, submarines, and other vessels. Adm. Somerville demanded that this fleet should either continue the fight against Germany and Italy, or sail with reduced crews to a Brit. port or to the W. Indies, or, if these alternatives proved unacceptable, that the Fr. commander should within six hours sink his ships, failing which the Brit. admiral would use the necessary force to prevent the ships from falling into enemy hands. The parleys continued all day, but Adm. Gensoul, cowed by orders from Wiesbaden, rejected all alternatives. Before darkness fell Adm. Somerville opened fire on the Fr. fleet, which was protected by heavy shore batteries. The action lasted for only ten minutes and was followed by strong attacks from Brit. naval aircraft, earned in the *Ark Royal*—whose reappearance in the news after its repeated 'destruction' in the enemy war communiques was one of the stock jokes in the war. The *Strasbourg* made off for Toulon, but was put out of action for a long time by Brit. torpedo attack. The *Dunkerque* was driven ashore, severely damaged and attacked again later so as to ensure her virtual loss to the enemy. The *Bretagne* was sunk, together with two destroyers. Heavy fire was directed on the Brit. ships but without damage. The Lt. fleet kept prudently out of the way. The net result of this tragic action was that of the eight capital ships which France possessed at the time of the armistice between Pétain and Hitler, practically all were prevented from being used by Germany against Britain. There was, of course, a furious outbreak in Germany, for the action at Oran went far to redress what might have been a serious adverse balance against Britain's naval power. The impotent Marshal Pétain, acting under orders from Hitler, ordered all Fr. warships which might still be on the high seas to intercept Brit. merchant shipping and repel all further attacks with fire or to scuttle themselves. A few days later (July 8) Brit. ships at Dakar, Fr. Senegal, took action against the *Richelieu*, the newly completed Fr. battleship. Terms

having been refused, a Brit. naval officer dropped depth charges astern so as to damage the propeller and steering gear, and later aircraft attacked the ship with torpedoes.

'Arandora Star'—*'Bartolomeo Colleoni.'*—In the same month (July) the Blue Star liner *Arandora Star* (15,500 tons), carrying 1500 Ger. and It. internees to Canada with a Brit. crew and guards numbering 500, was torpedoed and sunk by a U-boat in the Atlantic, about 1000 survivors being landed in Scotland. The frantic struggle between Ger. and Its. for places in the rescuing boats offered to the world a significant illustration of enemy morale. On July 19 H.M.A.S. *Sydney* (6850 tons), accompanied by a smaller destroyer force, won further laurels for Dominion naval forces by sinking the It. cruiser *Bartolomeo Colleoni* (3069 tons) in the Mediterranean. The It. ship, with another cruiser, sped for her base, and being one of the fastest ships in the world's navies ought to have escaped. But accurate fire from the *Sydney* reduced her speed and enabled the destroyers to complete her destruction. In this month, too, a U-boat torpedoed and sank the *Mckees*, a Fr. merchant ship off Portland, which was carrying 1280 Fr. naval officers and ratings for repatriation from England. This was a peculiarly cynical outrage, for the nationality of the ship was plainly displayed. There were only 400 survivors.

British Merchant Marine Losses.—*'Jerris Bay.'*—While the enemy's attention was almost exclusively devoted to the invasion of the N. neutrals, the losses of Brit. and allied merchant shipping sank to very low figures; but from then onwards the curve of destruction rose sharply, for the anti-U-boat craft employed on convoy escorts were progressively depleted. Hence it was all the more valuable to the allied cause to receive from the U.S.A. in Sept. some fifty old destroyers in return for the lease of defence bases in Brit. Atlantic ter. (W. Indies and Newfoundland). But the toll of losses continued to rise until, in Oct., it reached just over 400,000 tons, of which 300,000 tons were Brit. The losses then declined and averaged some 68,000 tons a week for the whole year. Their further substantial diminution, however, remained one of the chief problems facing the Brit. forces, especially as it was clear that the Ger. Gov. were bending their energies throughout the winter months to the construction of a great many more U-boats in order to offset the advantage, which Britain was obviously going to obtain from President Roosevelt's Lease-and-Lend Bill, by sinking cargoes of planes, guns, and tanks coming over the Atlantic. One of the Ger. pocket battleships at large in the Atlantic made an attack on Nov. 5 on some thirty-eight ships in convoy, but all save five of them escaped, the immunity of the remainder being due to the gallant action of the armed merchantman *Jerris Bay* (Capt. E. S. Fogarty Fegan) which was accompanying the convoy and which, despite its greatly inferior armament, gave battle to the

enemy against overwhelming odds and being of course sunk (sixty-five of her crew were rescued later by a merchant ship). Capt. Fegan, severely wounded, went down with his ship. Homage to his bravery and that of his crew was paid in the House of Commons by Mr. Churchill and by Mr. A. V. Alexander, First Lord of the Admiralty, and on Nov. 22 Capt. Fegan was posthumously awarded the V.C.

In the Mediterranean, where, as we have seen, the collapse of France had left the Brit. Mediterranean Fleet substantially inferior to the It. fleet, the balance was soon to be redressed in dramatic fashion. Brit. convoys and squadrons had continued to sail the sea at will, and every contact between the two navies ended with the precipitate retirement of the faster It. force. Engagements on various dates between June and Oct. had, however, already rather seriously reduced the It. Navy, when on Nov. 11, between Italy and Albania, a Brit. cruiser force came up with an It. convoy of four ships escorted by two destroyers. One was sunk, two set on fire, and one of the escort damaged before she could retire under the smoke screen she had put up for her own protection. The same night Fleet Air Arm aircraft, despite heavy anti-aircraft defences and balloon barrages, delivered a daring attack on the main It. fleet lying in Taranto. The new It. battleship *Littorio* and two of the *Cavour* class battleships were damaged so that they had to be beached to prevent their sinking, one of the latter so seriously that she was later abandoned. Two cruisers in the inner harbours were also damaged. The bulk of the fleet left the port, which till then had been its chief base, a few days later. At one stroke the It. battle fleet had been reduced from superiority over Sir Andrew Cunningham's fleet to inferiority, even on paper. This was evident not long afterwards when the remnant of the It. fleet, consisting of the *Vittorio Veneto*, the other big new battleship, and a large number of cruisers and destroyers, on Nov. 27 encountered a Brit. force under Sir James Somerville—whose flag-ship was the *Renown*—S. of Sardinia. For once again the action took the form of a chase in which the Brit. ships naturally became strung out, the *Renown* leaving her heavier consorts far behind. But the It. ships were not to be caught and retired under smoke screens to the fortified port of Cagliari. That Adm. Cunningham's freedom of action was now greatly enhanced was shown decisively during the battle of the W. Desert, when his ships heavily bombarded It. positions at Bardia and Tobruk and elsewhere on the coast of Cyrenaica and thereby made an essential contribution to the hurricane Brit. victory (see AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN, *Battle of the Western Desert*). By this time, however, the hard-pressed Its. were receiving military aid from Germany in the form of bomber aircraft, which were based on Sicily. A major sea and air action was fought in the Central Mediterranean on Jan. 10, 1941, when

escorting ships of a convoy, passing through the Sicilian Channel and laden with much material assistance for Greece, were attacked by Ger. bombers. Two It. destroyers had been encountered earlier in the morning; one fled to safety, the other, heavily outgunned, fought courageously until she went down with all hands. This action was fought within range of the It. guns on Pantelleria Is. Shortly after noon the new aircraft carrier *Illustrious* (23,000 tons) was heavily attacked by fifteen Junkers dive-bombers of the Luftwaffe, assisted by It. aircraft. Five separate attacks were made on the *Illustrious*, the Ger. pilots, with great recklessness, penetrating heavy barrages of thousands of shells and dropping a number of heavy-calibre bombs, one of which, a 1000-lb. bomb, hit the aircraft carrier below the bridge. The ship, though shaken from stem to stern, maintained a withering fire, and eventually, though suffering damage and casualties, arrived safely in port, where she was repaired. The 9100-ton cruiser *Southampton* was also hit, and later, owing to the outbreak of fire aboard, was abandoned and sunk by Brit. forces, most of the crew being saved. The Ger. and It. dive-bombers were heavily engaged by Brit. naval aircraft and twelve enemy planes were destroyed. The convoy emerged safely from the action and reached its destination. In the early morning of Feb. 9 ships of Force "H" under Vice-Adm. Sir James Somerville, consisting of the battle cruiser *Renown* and the battleship *Messina*, the aircraft carrier *Air Royal*, and the cruiser *Sheffield*, accompanied by light forces, bombarded military targets in Genoa, firing over 300 tons of shells into the port (see further under GENOA).

Loftoten Islands Raid.—The reality of sea-power and the value of the element of surprise in its operation were well exemplified on March 4 when ten enemy merchant vessels and an armed trawler were sunk, over 200 Gers. taken prisoner, together with a number of Norwegian traitors, in a naval raid on the Loftoten Is. The main object of the raid, which was successfully accomplished, was to destroy the plant used for the production of fish oil for explosives, the whole of the output of which was absorbed by the Ger. masters of the is.

Material aid came from the U.S. Govt. in the spring of 1941 with the arrival in Brit. waters of fifty-five U.S. Navy submarine chasers and eighteen mosquito torpedo-boats to join the Brit. Navy in hunting down the Ger. U-boats. These were the first of ninety-nine U.S. warships scheduled for transfer to the Brit. Navy under the Lend-and-Lend Act which passed Congress in March. Other ships included in the transfer were seventeen over-age destroyers and nine over-age submarines. It was stated at the time that far more than these ninety-nine vessels would be sent if Britain required them.

Battle of Cape Matapan.—On March 28 was fought an important naval battle in

the Mediterranean when, some 100 m. to the S.W. of Cape Matapan, Adm. Cunningham destroyed three heavy It. cruisers and two large destroyers, while another destroyer and a new battleship of the *Littorio* class sustained serious damage. The sole Brit. loss was that of one aircraft and its crew of two (see MATAPAN. BATTLE OF CAPE).

Battle of the Atlantic Operations between April 1941 and June 20, 1942.—For seven nights in the spring Brit. bombers made repeated attacks on the two Ger. battle cruisers *Scharnhorst* and *Gneisenau*, which were sheltering in Brest harbour. While these two extremely powerful armoured vessels were at large they might always succeed in catching some Brit. merchantmen, and experience showed that the last thing they sought was an encounter with Brit. battleships. Brit. planes repeatedly bombed the two ships while they were in Brest harbour, it being of the highest importance to do everything practicable to reduce the great losses that were being sustained in what was called the battle of the Atlantic. Until the U.S.A. came into the war (Dec. 1941) the burden imposed on the R.N. was heavy in the extreme, for though Amer. ships convoyed supplies over part of the distance from Amer. ports it was some time before the protection was adequate enough to relieve the Brit. fleet from tasks which precluded action wheresoever Ger. or It. ships of war might be encountered. Even though President Roosevelt had extended the 'combat zones' to the Mediterranean (June 1940) this protection could not in the nature of things compensate Britain for the loss of the Fr. fleet. Yet even in the Mediterranean the R.N. was always on the alert. Thus on April 21 units of the Mediterranean fleet carried out a 45-min. bombardment of Tripoli, some 530 tons of 15-in. and smaller calibre shells being poured into the harbour and port installations, sev. supply ships being sunk and great fires and explosions caused on the Sp. Mole, railway station, and naval headquarters without either casualties or damage to the Brit. ships. In May, during the battle for Crete, the navy was engaged in most hazardous operations, their losses (three cruisers, one anti-aircraft cruiser, and six destroyers) demonstrating the inability of surface ships to defend themselves in narrow waters unless they held the mastery of the air. The great event, however, of this time was the naval action which began off Greenland and ended some 400 m. off Brest, resulting in the sinking of the *Hood* and of the Ger. battleship *Bismarck*, May 27 (see further under 'BISMARCK. THE'; 'Hood. THE'). About the same time the monitor *Terror* (7200 tons) and the equally famous gunboat *Ladybird* (625 tons) were lost in Ger. air attacks off the Libyan coast, both putting up a most spirited resistance before going down before overwhelming fire (see under AFRICA, NORTH. SECOND WORLD WAR. CAMPAIGNS IN, *The Struggle for Libya*). The main event in June was the sinking by a Brit. submarine of

the *Gorizia* (It. cruiser of 10,000 tons), the last of her class, N. O., under Vice-Adm. Sir James Somerville in the Mediterranean were responsible for many convoys sailing in safety to their destination. For instance, between July 21-24, a big convoy escorted by the *Renown*, cruisers, and the famous aircraft carrier *Ark Royal*, was repeatedly attacked by hostile aircraft, E-boats, and at least one submarine, which last-mentioned craft was sunk. One Brit. destroyer was damaged and had to be sunk, but the enemy lost at least sixteen bombers. By way of contrast to this comparative immunity of a Brit. convoy, a large Ger. convoy of twenty-six transports laden with troops, munitions, and equipment, and a sea-going barge laden with tanks, strongly escorted by destroyers, fighter planes, and mine-sweepers, was practically annihilated by the Russians in its vain attempt to make a landing on the Baltic coast, the Gers. losing four destroyers, thirteen transports, and a tanker, the rest of the convoy fleeing in confusion.

Italian Naval Attack on Malta.—The first naval attack on Malta was made by a swarm of E-boats on July 26. After an all-night bombing raid the It. E-boats were discovered off the Is. at dawn. Brit. aeroplanes at once attacked, showering bombs on the intruders, while the Valletta coastal batteries opened an intense fire. Enemy fighter patrols tried to assist their surface craft, but soon lost three machines. The Its. then launched torpedoes in the direction of the breakwater, but the R.A.F. destroyed four E-boats, while the coast defences accounted for five more. It then appeared that the E-boats were acting as a cover for small torpedo-carrying craft, which tried to break into the harbour. Eight of them were blown up and none succeeded in entering the harbour. During the engagement the Valletta bastions and every vantage point were crowded with cheering spectators, an evidence of the great heart of the Maltese throughout the war.

Enemy Losses up to August 1941.—It may be noted that at this date the Admiralty estimated the enemy merchant shipping losses since the beginning of the war, by capture, scuttling, and sinking, at 4,007,000 tons (including fifty-one ships of 200,000 tons sunk by the Russians), this total being made up as follows: Ger., 2,321,000; It., 1,533,000; Finnish, 34,000; other ships in enemy control, 119,000. Also, from the outbreak of war up to Aug. 1941, 1118 enemy aircraft had been destroyed or damaged by ships' gunfire and naval aircraft, 537 being shot down into the sea and 581 damaged (203 believed destroyed). Of the 537 definitely destroyed, 348 fell to the guns of the fleet, 122 to naval aircraft, 55 to merchant ships, and 12 to allied warships.

'Convoy Battles in the Mediterranean.'—*The 'Ark Royal' and 'Cossack' Sunk.*—*H.M.A.S. 'Sydney' Lost.*—In the Mediterranean again on Sept. 27-28 an important Brit. convoy beat off persistent attacks from the air. One merchant ship was

damaged and had to be sunk but without casualties. H.M.S. *Nelson* was hit by a torpedo but was not impaired. Thirteen enemy planes were destroyed by Swordfish aircraft from the *Ark Royal* and by naval gunfire. On Nov. 8 an enemy convoy of eight supply ships escorted by destroyers was sighted S. of Taranto by a Maryland aircraft, and a patrolling Brit. force under Capt. Agnew intercepted the convoy the following day, by which time it had been joined by two more merchant vessels and two more destroyers. Despite this disparity the Brit. force gave battle. Nine of the ten supply ships were sunk and the tenth, a tanker, became a total loss, while two It. destroyers were sunk and two seriously damaged. In this month too were lost the destroyer *Cossack*, famous for the rescue of Brit. prisoners from the *Altmark* (Feb. 1910), and the aircraft carrier *Ark Royal* (see further under 'ARK ROYAL'), off Sollum, and the old but reconditioned 31,000-ton battleship *Barham*, which was torpedoed and sank in four minutes in the Mediterranean (Nov. 25) (see under 'BARHAM, THE'). A few weeks later (Dec. 19) the battleships *Queen Elizabeth* and *Vanguard* were severely damaged at Alexandria by human torpedoes which had penetrated the harbour. Brit. submarines in the Arctic inflicted heavy losses on Ger. ships carrying supplies to the Murmansk front. The *Tigris* sinking five and the *Trident* three transports, many other vessels probably being sunk. Early in Dec. the famous Australian cruiser *Sydney* (7000 tons) was lost in action with a Ger. armed raider, *Steirmark* (9400 tons). The sole information concerning the action was obtained from the survivors of the Ger. boat, who numbered 330. The fight had evidently been at close range. After the *Steirmark* had been blown up the *Sydney* disappeared over the horizon and nothing more was heard of her.

'Prince of Wales' and *'Repulse'* Sunk by Japanese Aircraft. -- Disaster overtook the Brit. Far E. fleet very soon after Japan, without declaring war, launched simultaneous attacks, on Dec. 7, on Pearl Harbour and on Siam (Thailand) with a view to invading Brit. Malaya. On Dec. 10 Britain's newest battleship, the 35,000-ton *Prince of Wales*, sister ship to *King George V* (q.v.), flying the flag of Adm. Sir Tom Phillips, one of the most brilliant officers of the R.N., together with the battle-cruiser *Repulse*, were sunk by Jap. bombers of Malaya, thereby profoundly altering the balance of naval power in the Pacific. The attacks were pressed home with the greatest determination, but the enemy aircraft had not to encounter fighter resistance such as the Ger. and Its. encountered in similar attempts to sink battle-ships by bombs. The anti-aircraft defences of the two ships were certainly used to good effect, but this was not enough, though seven planes were brought down, and the lesson of the importance of protecting the skies above the seas where the navy operated was once more painfully learned. The

absence of adequate fighter protection was due to the fact that none was available for the operation. The bombs, which were dropped from a height of more than 15,000 ft., straddled both ships; one pierced the *Repulse*'s aircraft hangar and penetrated to the marines' mess deck, starting a fire which the crew fought until the ship sank. Both warships opened a fierce anti-aircraft barrage when Jap. torpedo aeroplanes launched torpedoes in their path. The *Repulse* managed to avoid nineteen of them, but a torpedo hit the *Prince of Wales*, damaging her stern and putting her rear armament out of action. The final attack came from aeroplanes roaring down from all directions. The *Repulse* was hit on the bow and then on the port side and stern. She started settling quickly and the crew abandoned her. A few miles away the *Prince of Wales* belched great clouds of smoke from amidships and eventually sank. Some 2330 men of 2925 were saved.

Japanese Losses in Merchant Shipping. -- To counterbalance allied disasters by land and sea in the E., Amer., Brit., and Dutch planes and Ainer. ships were early taking toll of Jap. shipping. On Jan. 15, 1942, for example, an Amer. submarine sank a 17,000-ton liner, and on the following day three merchant ships, off Tokio Bay. This brought the toll of Jap. losses at the hands of Amer. forces in the Pacific to thirty-five vessels—fourteen being warships, including the 29,000-ton battleship *Haruna* (laid down in 1912 but entirely reconditioned since then). Between Dec. 13, 1941, and Jan. 16, 1942, Dutch submarines and aircraft also sank two cruisers, four destroyers, and other ships. On Jan. 23 Dutch bombers attacked a large Jap. convoy which was trying to pass through the Mawesar Straits between Borneo and Celebes, direct hits being scored on a battleship, two cruisers, a destroyer, and four transports. The fight was resumed on Jan. 24-25 by Dutch and Amer. bombers and Amer. destroyers. Many Jap. cruisers, destroyers, and transports were sunk, the total loss being the heaviest sustained by the Jap. up to that point. The battleship, too, was probably sunk, for a large ship went down, leaving only the tip showing above the water.

The Amer. Navy won a considerable victory in an attack on the Marshall and Gilbert Is. on Feb. 11, their cruisers, carrier-borne aircraft, and destroyers sinking sixteen Jap. vessels aggregating 100,000 tons. The importance of a progressive reduction of Jap. shipping of all kinds so early was evident when account was taken of the wide commitment of the Jap. warships operating thousands of miles from Japan, and the comparatively restricted shipbuilding potential in their yards.

Escape of 'Gneisenau,' 'Scharnhorst,' and 'Prinz Eugen.' — It was at this time (Feb. 12) that the Ger. pocket battleships *Scharnhorst* and *Gneisenau* and the 10,000-ton cruiser *Prinz Eugen* (see under 'BISMARCK, THE'), accompanied by destroyers,

torpedo-boats, E-boats, and mine-sweepers, and well escorted by fighter aircraft, came out of Brest harbour and escaped through the straits of Dover to Germany. Visibility was poor and the enemy ships, which hugged the Fr. coast and were protected by screens of fighters from Fr. and Belgian airfields, which formed an 'umbrella' over the whole squadron, were never visible from the Brit. coast. In face of intense fire by the warships and fighter planes, Brit. coastal aircraft and swordfish planes pressed home their attack on the squadron, six of the Swordfish being lost. The commander of the Swordfish squadron—Lt.-Cdr. Esmonde—was awarded the V.C. (posthumous). No Brit. warship was lost, but public uneasiness at the escape of the Ger. ships, coupled with the disasters in the Far E., evoked a critical tone in the press and in the Commons.

Great Naval Battle off Java (February 27-28, 1942). Late in this month there was a notable naval and air battle off Bali, exceeding in results even that of the Macassar Straits. Dutch and Amer. warships inflicting heavy losses on a Jap. invasion fleet; but as yet the strength of the Allies was inadequate to the prevention of invasion anywhere and everywhere in the S. Pacific and shortly afterwards the enemy landed on Bali. Another naval battle was fought on the night of Feb. 27-28 off the N. coast of Java but with severe loss to the Allies. In this action an allied force consisting of the Brit. cruiser *Exeter* (8390 tons), the Australian cruiser *Perth* (6830), the Amer. cruiser *Houston* (9300), the Dutch cruisers *De Ruyter* and *Java* (each 6000 tons), commanded by Adm. Doorman in the flag-ship *De Ruyter*, and accompanied by one Dutch and three Brit. destroyers, made contact with the Jap. ships half-way between Surabaya and Bawean Is., the Jap. force comprising seven cruisers, some of 10,000 tons, and thirteen destroyers, organised in two flotillas. The Dutch destroyer *Kortenaer* was soon sunk; the *Exeter* was hit in the boiler room and dropped out of the line; the Brit. destroyer *Electra* joining in a counter-attack disappeared into an enemy smoke screen and was not seen again. Later the enemy broke off the action under a smoke screen, but shortly afterwards, near Rambang, two enemy cruisers were seen and battle was again joined (March 1), when both the *De Ruyter* and the *Java* were hit simultaneously, blew up, and sank. A similar fate seems to have befallen the *Perth* and *Houston* not long afterwards. The *Exeter*, her speed considerably reduced, the Brit. destroyer *Encounter*, and the Amer. *Pope* were all sunk later by three Jap. cruisers. In all the Allies lost five cruisers, seven destroyers, and a sloop (*Varro*, Australian), against the Jap. loss of a 10,000-ton cruiser and one small cruiser for certain and probably four destroyers, while all the other cruisers were set on fire.

The Battle of Sirte.—Reverting again to the Mediterranean, the same month saw another successful convoy action

(March 22-24). A Brit. convoy, with supplies for hard-pressed Malta from Egypt, with the protection of a 6-in. gun cruiser, anti-aircraft cruisers, and destroyers under the command of Rear-Adm. Vian of *Cossack* fame, sighted and drove off four It. cruisers without loss to convoy or escort. Later the battleship *Littorio*, two 8-in. gun cruisers, and four 6-in. gun cruisers and some destroyers were sighted and, despite the disparity in strength, action was joined, a torpedo hit being scored on the *Littorio*, which was also hit by a Brit. cruiser's gun-fire. Other It. ships were also hit and the enemy force, thrown into confusion, withdrew.

Further Losses in Far East.—Battle of the Coral Sea.—In April further Brit. losses were sustained in the Far E., the cruisers *Dorsetshire* and *Cornwall* (each 10,000 tons) being lost through Jap. air attack in the Indian Ocean, over 1100 survivors being landed. About the same time the carrier *Hermes* was sunk off Trincomalee (see also under AIRCRAFT CARRIER). But what was up to this date perhaps the biggest naval battle since Jutland—the battle of the Coral Sea was fought (May 1-8) off the Solomon Is., some 1000 m. from the coast of Queensland, between Amer. and Australian naval forces and the Jap. fleet. This action certainly saved Australia from an immediate attempted invasion. The allied fleet and planes first sank a Jap. light cruiser, two destroyers, four gunboats, and, later, an aircraft carrier, three heavy cruisers, one light cruiser, and two destroyers; a total of fifteen warships sunk, and a grand total of thirty-seven ships sunk, damaged, or probably sunk. The Amer. lost one aircraft carrier, one destroyer, and one tanker. This great naval and air battle temporarily ceased on May 9. It represented the continued effort by the Jap. to extend their conquests towards the S. and S.E. Their first efforts were aimed at expanding their bases, but the Allies' air forces had so effectively bombed their landing fields that Japan's plans were frustrated. In this battle of the Coral Sea the issue was decided between aeroplanes flown from the opposing aircraft carriers.

The Battle of Midway Island.—The battle was in effect a new kind of naval conflict and the experience was to be repeated a month later in the important battle off Midway Is., the Amer. naval base 1300 m. N.W. of Hawaii, when Amer. navy and army pilots from both shore bases and carriers dealt the blows which repelled attack by a powerful Jap. fleet, thereby confirming the significance of the naval revolution which had transformed warfare at sea. In the Midway battle four Jap. aircraft carriers were sunk, each with a complement of 1500 men. At least three transports, carrying 6000 troops, were torpedoed and sunk. This was the worst defeat in Japan's naval hist., for the spearhead of her naval and air striking power was broken by the loss of half her best aircraft carriers and she had now lost at least six of the eleven or more of the fully effective fleet of carriers.

with which she began the Pacific war. At least 200, and probably 250, planes, together with their trained personnel, went down with the carriers lost at Midway. For this victory the Amer. Flying Fortresses, which repulsed and scattered the Jap. naval forces, were chiefly responsible. While the immediate result of these two battles was the removal of the Jap. threat to America's forward naval bases in the Pacific, the ultimate result was to shift the balance of naval power in the Pacific from its extremely one-sided bias in favour of Japan. The lessons of these battles, coupled with those of Crete and the loss of the two great Brit. ships, *Prince of Wales* and *Ripon*, was not lost on the Amer. House of Representatives, which at this moment had before it a Bill which, at a cost of more than £200,000,000, would add 1,900,000 tons of warships to the Amer. Navy. It was decided that roughly one-half the construction involved should go into carriers and cruisers of various types, the remainder into destroyers and escort craft and patrol craft. New battleships had, however, already been provided for and six, were due to be launched in the ensuing months; but undoubtedly the construction of more capital ships was, for the reasons stated, postponed, though by no means abandoned; for, as Jap. aircraft carriers were sunk or disabled, battleships were likely again to become a mighty weapon on the high seas, whether for offensive action or for counter-attack against a raiding fleet, even if the days of Jutland battles were seemingly over so far as those battles meant only capital ships firing directly at each other.

Hazards of Mediterranean Convoys.

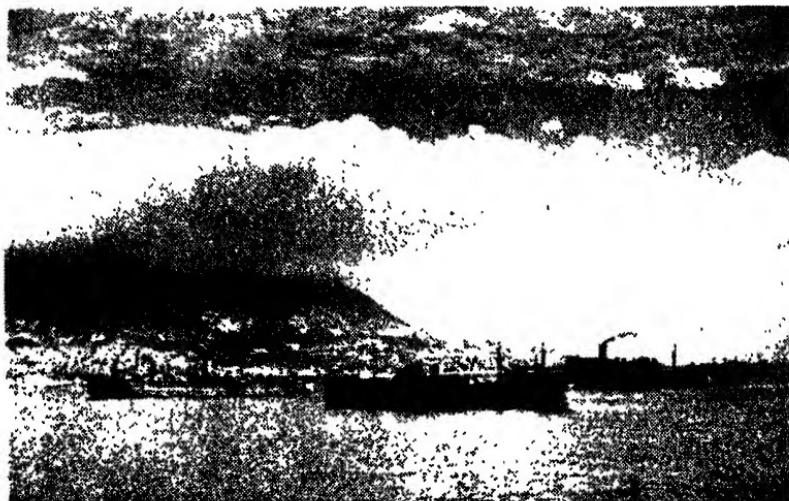
During this period convoying in the Mediterranean had grown increasingly hazardous, more so even than to Murmansk; for Britain had lost the command of the sea in these narrow waters of the Mediterranean over which Nazi planes could operate freely from Sicily, Crete, and elsewhere. Consequently the problem of sending supplies to Malta and Libya became greatly aggravated and the ill fortune which awaited an important double convoy at this time had a most deleterious effect on the Eighth Army's battle against Rommel's army May-June 1942 (see also AFRICA, North, Second World War, CAMPAIGNS IN, *Battle for Libya*). It had been decided to sail in two convoys so as to disperse the enemy's efforts to concentrate his attacks. The W. convoy got to Malta after destroying over sixty enemy planes. The E. convoy, under Rear-Adm. Vian, was also steering towards Malta when a force of 18 battleships, cruisers, and submarines tried to intercept it; and eventually, owing to the exhaustion of anti-aircraft ammunition, Rear-Adm. Vian decided to return to Alexandria. The R.N. in these two convoy attacks lost one light cruiser and four destroyers; the enemy had one battleship torpedoed and one 8-in. gun cruiser, two destroyers, and one U-boat sunk.

Naval Operations, July-December 1942.—During this period the most outstanding event in the W. was the allied landing in N. Africa on the night of Nov. 7-8. Until forces were ashore the responsibility for the operation lay in the hands of the navy, whose success was measured by the fact that the initial convoys arrived at the right time in the right place practically unscathed. The only damage was one Amer. ship torpedoed, but all her troops were landed without loss. Until the U.S. and royal air forces were able to operate from captured air-fields the fleet air arm provided not only protection to the ships, but also tactical reconnaissance for the army ashore. Thereafter the allied navy continued to keep the armies supplied and reinforced in the face of heavy U-boat concentrations, and maintained the offensive at sea against enemy forces. Meanwhile important naval operations were taking place in the S. Pacific. With the defeat of the Jap. at the Coral Sea and Midway Is., battles, the initiative passed to the Amer. and, on Aug. 7, Amer. marines landed in the Solomon Is., seizing the harbour of Tulagi. Though taken by surprise, the Jap. sent cruisers and destroyers to attack on the night of Aug. 8-9 and they had decidedly the best of the battle. H.M.S. *Canberra* and the U.S.S. cruisers *Quincy*, *Cincinna*, and *Astoria* were sunk. The Jap. escaped with little damage. Most of the Amer. personnel were saved. But the Allies achieved their object, since the Jap. were unable to interfere with the transports. Every subsequent Jap. attack on the Solomons was decisively repelled with heavy loss in transports. There was a major naval action, which raged for several days in Nov., particularly on Nov. 12-13, between surface ships, off the Solomons. It was precipitated by a strong Jap. attempt to reconquer a vitally important beach-head on Guadalcanal (q.v.). A large Jap. fleet of transports steamed southward from the Shortland area. Strong reinforcements for Amer. land troops had just been landed in Guadalcanal and the Amer. cruiser and destroyer screen covering the landing was maneuvered so as to intercept the Jap. ships. The resulting action took place off Savo Is. between the Is. of Guadalcanal and Florida. The smaller Amer. ships attacked the Jap. battleships of the *Kongo* class at point-blank range. Their leaders, Rear-Adms. Daniel Callaghan and Norman Scott, were killed, but the Jap. force was heavily damaged and disrupted. The next night there was another clash between surface ships, two Amer. battleships of the new *North Carolina* and *South Dakota* class taking part. Sporadic and fierce fighting, between the ships and also in the air, went on for some days. This was the biggest naval battle of the war up to that time, and the Jap. losses were one battleship, three heavy cruisers, two light cruisers, five destroyers, and eight transports sunk, and one battleship, six destroyers, and four cargo transports damaged. The Amer. losses were two light cruisers and seven destroyers sunk.

It was during this period that the Fr. fleet at Toulon was scuttled. Following on the landing of Brit. and Amer. forces in Fr. N. Africa in Nov., Ger. forces entered Toulon. But the Fr. warships in the port were immediately scuttled by their crews. The battleships there were the *Duguay-Trouin* and *Strasbourg*, each 26,500 tons, one old battleship, the *Provence*, four 10,000-ton cruisers, three light cruisers, one seaplane carrier, and some twenty-eight destroyers (Nov. 6, 1942).

tured at Tambach in the closing days of the war.)

N.E. of Finschafen and in Huon Gulf, off New Guinea, on March 2-4, a large Jap. convoy of twelve transports and ten warships (cruisers and destroyers), representing an aggregate tonnage of 90,000 tons, was attacked continuously by allied air forces and completely wiped out, together with more than eighty Jap. planes. The ground forces, estimated at 15,000 men, who were destined for an



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TRANSPORTS LYING OFF GIBRALTAR: PART OF THE GREAT ALLIED NORTH AFRICA EXPEDITION

Throughout the navy continued to provide escorts for the numerous convoys to Russia, Malta, the Persian Gulf, and elsewhere. One outstanding event was the successful passage of a large convoy to Russia on New Year's Eve, 1943. All the merchant vessels reached Russia safely, but the destroyer *Achates* was lost and the *Onslow* damaged. The Brit. destroyers were commanded by Capt. R. St. V. Sherbrooke (awarded the V.C.), whose escort was attacked by a greatly superior Ger. force consisting of a pocket battleship (*Lützow*), a cruiser (*Hipper*), and six destroyers. The action was fought in snowstorms and in semi-darkness off the N. Cape, Norway. It appears that the admiral commanding the Ger. task force had mistaken the two Brit. cruisers *Kent* and *Jamaica*, which had come to the assistance of their convoy, for the vanguard of a battle squadron. He had therefore broken off the action and retired in accordance with previous orders (see *Führer Conferences on Naval Affairs* (trans. by U.S. Naval Dept. and Admiralty), being trans. of documents cap-

attack on the Allies in New Guinea, were killed to a man. The Allies' total loss was only one bomber and three fighter aircraft, while a few other planes were damaged. This battle of the Bismarck Sea was so complete as to amount to a major disaster to Jap. arms and seacraft, besides demonstrating the superiority of allied fighter aircraft and pilots over the Jap.

It may be mentioned here that by the end of Jan. 1943 aggregate Brit. losses (as stated in the Commons, Feb. 4) were as follows: capital ships, 5; aircraft carriers, 7; cruisers, 25; armed merchant cruisers, 14; destroyers, 94; corvettes, 14; submarines, 44; monitors, 1; sloops, 8; mine-sweepers, 22; trawlers, 156; drifters, 14; mine-layers, 1; yachts, 3; gunboats, 5; cutters, 3. But in spite of losses the fleet was much stronger at that date than it was a year previously, and indeed during these three years of the war no fewer than 900 vessels of various classes had been added to the R.N. The ships lost in these three years by Germany, Italy, and Japan were: Germany, 1 battleship, 1

pocket battleship, 4 cruisers, 39 destroyers and torpedo-boats, 4 raiders, and 69 other miscellaneous warships, minesweepers, and small craft. Italy: 10 cruisers, 48 destroyers and torpedo-boats, and 35 other miscellaneous warships, etc. Japan: 2 battleships, 6 aircraft carriers, 17 cruisers, and 70 destroyers. (No official figures available for miscellaneous small craft, but the number was a high one apart of course from transport craft.)

Naval Operations, 1943—The most significant feature of sea operations in 1943 was the gradual reduction of the Ger. submarine menace. In the months May-July 1943 the Allies sank ninety U-boats. In the first six months of the year the number of ships sunk per U-boat operating was only a quarter that in the first half of 1942. Moreover during the first half of 1943 new ships completed by the Allies exceeded sinkings from all causes by more than 3,000,000 tons. Before the descent upon Sicily (see *Conquest of Sicily* in the article WORLD WAR, SECOND) an armada of warships, troop transports, supply ships, and landing craft proceeded through Atlantic and Mediterranean waters, with scarcely any interference from U-boats. Over 2500 vessels were involved in these latter operations and the losses were only about 80,000 tons. In the months Aug.-Oct. approximately sixty U-boats were destroyed. This brought the total Ger. losses since Sept. 1939 to between 700 and 800 submarines. The loss of 150 submarines in the six months May-Oct. 1943 meant a loss of 6000 trained men of the submarine service, a fact which was found to have a profound effect on the morale of the crews. In addition to the sixty U-boats sunk between Aug. and Oct. there were also a large number of "probables." The Gers. had introduced new U-boat weapons and tactics; but the Allies were able to cope successfully with the changing situation.

Following the collapse of It. resistance after the conquest of Sicily the It. Navy surrendered under the terms of the armistice with Marshal Badoglio. On Sept. 11 the prin. ships of the It. Navy—four battleships, six cruisers, and seven destroyers—which had sailed from Spezia, came into Valletta under the escort of two Brit. battleships and a destroyer screen. Together with smaller ships, the total was thirty. One uncompleted battleship fell into Ger. hands. When the fleet started from Spezia it had another capital ship with it, the *Roma*, but this ship was sunk by Ger. bombers as the fleet proceeded southwards—a desperate daylight attempt to destroy the fleet of their former allies whose departure they were too late to forestall. The result of this surrender and of the Allied victories in N. Africa was that the R.N. once again completely dominated the Mediterranean with the great strategic advantage of greatly shortened sea routes.

Brit. midget submarines carried out a daring attack on main units of the Ger. battle fleet in their protected anchorages in Alten Fjord, N. Norway, on Sept. 22,

inflicting severe underwater damage on the battleship *Tirpitz*. The attack involved extreme hazards and three of the submarines were lost, but the attack as a whole was successful. The submarines had to penetrate a highly defended base and, to do so, they had to pass through the minefields guarding the approaches to the anchorage; and, after negotiating the intricate fjords, always vigilantly patrolled by the Gers., had to carry out an attack in the strongly protected and confined waters where the ships lay moored and, finally, to regain their base, the same obstacles had to be overcome.

In the S. Pacific there was no great naval battle between the Allies and the Jap. fleet during 1943, but there was considerable activity on both sides in convoy work and in covering landings and, generally, in combined operations. Amer. warships co-operated effectively with the allied air forces in covering the allied landing near Lae in Huon Gulf, New Guinea, in Sept. 1943. A remarkable feature of these operations and others of subsequent months was that the Jap. Navy made no attempt to interfere with the Allies, a fact which probably meant that their previous losses were straining their resources. On Nov. 1 two heavy Jap. cruisers and three destroyers were sunk and many others probably sunk in a devastating raid on enemy shipping of all kinds in Rabaul harbour. This was the heaviest loss inflicted on the Japs. in this area since the battle of the Bismarck Sea (see further under PACIFIC CAMPAIGNS IN SECOND WORLD WAR).

The outstanding naval event of the year was the sinking of the 26,000-ton Ger. battleship *Scharnhorst*. She was brought to action off the N. Cape, Norway, on Dec. 26, when cruisers and destroyers supported the battleship *Duke of York*, under the command of Adm. Sir Bruce Fraser, in sinking her, the whole of the main action, which started in the late afternoon in the half-light of the Arctic dawn, being fought in the dark with the aid of radiolocation and starshells. The *Scharnhorst* was first seen at 9.30 a.m. steering towards a Brit. convoy bound for N. Russia which was protected by cruisers. The cruisers opened fire and the *Scharnhorst* turned away. Adm. Fraser's force, unknown to the Gers., was then many miles to the westward, steaming at speed in the hope of getting between the *Scharnhorst* and her base at Alten Fjord. Touch was lost with the Ger. ship shortly before 11 o'clock, but she reappeared, as was expected, sev. hours later, again making towards the convoy, which she could have disposed of very quickly had she been able to get near enough; but after the cruisers opened fire she did southwards, with the cruisers in pursuit. The chase lasted till the afternoon until the *Duke of York*, towards which the cruisers had driven the Ger. ship, was able to intercept her and open range at only 6 m. From 5 p.m. till 6.24 p.m. the two battleships fired at each other

continuously, when the *Scharnhorst*, though hit, gradually drew out of effective range. Then her speed slowed down owing to one hit from the *Duke of York* below the water line and seven destroyers then turned in, heading straight for her, and fired torpedoes at close range. From then on the fate of the Ger. battleship was sealed, for the *Duke of York* was able to open fire again with her 14-in. guns, hitting her repeatedly until she started to circle and almost stopped. Cruisers now attacked with torpedoes from one side and destroyers from the other and soon after this she sank. Some thirty-six survivors of a crew of over 1400 were picked up, the Brit. casualties being seventeen killed and no ships lost. The loss was a severe blow to Germany, for it was on the *Scharnhorst* that she relied to prevent vital supplies reaching Russia at a particularly critical stage of the campaign on the E. front.

In the bay of Biscay on Dec. 27-28 three of eleven Ger. destroyers, which had emerged to convoy a Ger. blockade-runner, were sunk by the two Brit. cruisers *Glasgow* and *Enterprise*. The blockade-runner had been intercepted earlier by a Coastal Command (q.v.) aircraft, which set her on fire with bombs so that she was abandoned in flames. It was soon after dawn on the following day that a Liberator of the U.S. Navy sighted the eleven Ger. destroyers about 200 m. from the spot where a Czech Liberator had bombed the blockade-runner to destruction. This Ger. force consisted of five modern *Narvik* class destroyers with five 5·9-in. guns and six *Elbing* class destroyers with four 4·1-in. guns—eloquent evidence of the importance to Germany of the blockade-runner's cargo, which probably contained Malayan rubber from the Jap. occupying authority. In the ensuing battle the two Brit. cruisers, who got in between the Ger. ships and their bases in S. France, scored many hits, while *Halifaxes*, Liberators, and a Sunderland co-operated. Beaufighters and Mosquitoes provided air cover for the cruisers. There was but little opposition from enemy aircraft. The armament of the Ger. *Narvik* class destroyers was little if at all inferior to that of the *Glasgow* (a 1937 cruiser) or of the much older *Enterprise* (1926), but their main purpose was to get away under a smoke screen after dividing up into smaller groups.

Naval Operations, 1944.—The chief naval event in 1944 was the Jap. defeat of the last week of Oct. during the Amer. invasion of Leyte Is. (Oct. 19). This menacing invasion of the Philippines tempted the Jap. Navy to emerge and risk an attack on Adm. Halsey's Third Fleet which, sailing westward across the Pacific, had already taken the Marshall, Marianas, and Palau Is. on the way and was now acting as general cover to the allied land operations; and also on Vice-Adm. Kincaid's Seventh Fleet, whose role was that of escort and close support of the military force on Leyte Is. On Oct. 22 ships of the Third Fleet took up positions E. of the Surigao and San

Bernadino Straits—the only passages through the Philippines—further N. off the Polillo Is., and E. of Luzon, as cover against any Jap. forces that might approach from those quarters. The Seventh Fleet continued in close support of the landing in Leyte Gulf, opening off the Surigao Strait. Next day Amer. carrier aircraft saw three Jap. forces approaching, two from the W. and one from the N. The first, coming through the Sulu Sea directly towards Surigao Strait, comprised two old battleships, three heavy cruisers, one light cruiser, and eight destroyers; the second, a stronger force, steaming through the Sibuyan Sea towards San Bernadino Strait, comprised two new battleships, one fairly modern battleship, two old battleships of the *Kongo* class, two light and ten heavy cruisers, and fifteen destroyers. The third squadron, coming from Japan, was seen 100 m. N. of Leyte Gulf, and comprised one large and three light aircraft carriers, two old battleships, three light cruisers, and eight destroyers. In the morning of Oct. 23, before the approach of this third enemy squadron was known, Amer. carrier-based planes attacked the other two enemy squadrons, while Jap. land-based planes attacked. Adm. Halsey's carriers cruising to the eastward. In this cross-air attack the Jap. lost 150 planes to the Amers', eight, but succeeded in hitting a light Amer. carrier which blew up and had to be sunk, the majority of the crew being saved. Amer. torpedo-plane attacks were concentrated on the Jap. force in the Sibuyan Sea and sank one light cruiser outright and damaged a number of other vessels, but the bulk of this Jap. squadron went on through the San Bernadino Strait during the ensuing night. The Jap. squadron in the Sulu Sea was attacked by bombers and fighters only and many ships were hit, but this squadron too held on its course, entering the Surigao Strait at night. Here it was engaged by the Seventh Fleet and completely defeated, one if not both its battleships, seven cruisers, and most of the destroyers, being sunk, for the Amer. loss of only a few motor torpedo-boats. The survivors of this Jap. squadron turned tail and retreated westward through the Sulu Sea again, but were sunk to the last ship by air attacks the next day. Prior to these nocturnal events the Amers. had learned of the approach, from the N., of the Jap. carrier force and Adm. Halsey at once sent a number of his carriers to meet the enemy carriers at dawn of Oct. 24. This attack achieved complete surprise. The largest carrier and two of the three smaller ones were sunk outright by Amer. air attacks, which also sank a destroyer and crippled a cruiser and the third smaller carrier. Of these the cruiser was sunk the next night by submarine, while the remaining Jap. carrier was trapped and also sunk, together with another carrier which had escaped damage from the air, by the guns of Amer. cruisers and destroyers. Both enemy battleships of this carrier fleet were hit by bombs and one also by torpedoes as well; all the

remaining cruisers and destroyers were hit by bombs and gunfire. No Amer. ship was hit in this action in the N. Halsey's carrier-borne aircraft then turned S., being now more urgently needed there than in the N. Meanwhile the Jap. Sibuyan Sea squadron, having passed the San Bernadino Strait and turned S. round Samar Is., came in contact with some of Kincaid's carriers and sank two of them by gunfire. But the enemy was then brought to action by Kincaid's fleet fresh from its night victory in the Surigao Strait, with which Halsey's carrier-borne aircraft, hurrying back from the N., now co-operated. Every Jap. ship was badly damaged, one heavy cruiser being sunk and a destroyer disabled, while the remainder of the squadron turned back through the strait, one straggling cruiser being sunk by pursuing Amer. cruisers. Next day carrier aircraft from both Amer. fleets—together with Gen. MacArthur's shore-based aircraft—kept up the attacks on the westward-retreating Japs., sinking two more cruisers and (probably) one battleship. In all three battleships, four carriers, six heavy cruisers, four light cruisers, and seven destroyers were sunk; while four battleships, five heavy cruisers, one light cruiser, and two destroyers escaped in a damaged condition. Amer. losses were one light carrier, two escort carriers, two destroyers, one destroyer-escort (equivalent of a frigate), and a few lesser craft sunk. Eight escort carriers, two light cruisers and five destroyers damaged.

Another notable event was the sinking of the last great Ger. battleship, *Tirpitz*, by R.A.F. Lancasters on Nov. 12. Some twenty-nine Lancasters, led by W.-Cdr. J. B. Tait and Sqdn.-Ldr. A. G. Williams, attacked the ship in Tromsø Fjord with 12,000-lb. bombs. There were seven direct hits and within a few minutes the ship capsized and sank. One bomber was lost, but the crew came down safely in Sweden. Previously the ship had lurked in Alten Fjord, a menace to allied sea traffic to and from Russia, but she was forced to leave her N. lair by the Russian advance late in the year into Petsamo and then anchored near the S. end of Haakoy Is., 4 m. W. of Tromsø. This final attack was the climax of a long series, which had probably disabled the ship as a fighting unit, though air observation did not definitely establish that fact. On her first appearance at sea on March 9, 1942, a torpedo from an aircraft of the Brit. carrier *Victorious* off the Lofoten Is. sent her back to harbour for repair. Refitted she attempted to attack a Russian-bound Brit. convoy on July 8, 1942, but was hit by seven torpedoes from a Russian submarine. She succeeded in reaching an anchorage in the Alten Fjord prepared for her but was unable to leave for fourteen months. In Sept. 1943 she joined the *Scharnhorst* in action against the very small Norwegian batteries in Spitsbergen, returning quickly to her lair for fear of a possible Brit. attack. Lying within a protective crinoline of nets, she was once more severely damaged, this time by the

torpedoes of midget Brit. submarines. In April 1944, when seen to be capable of moving again, the period of air attacks on her began. Numerous hits by home fleet bombers, including at least three with heavy bombs, put her out of action for another five months. Bomber Command then took up the task with a succession of attacks on Sept. 15, Oct. 29, and Nov. 12, the last being the only time that the attackers were able to see the ship properly. One 12,000-lb. bomb hit her amidships, another in the bows, and a third near the stern. The ship heeled over rapidly and capsized with 700 ft. of her keel sticking out of the water. The *Tirpitz* was as well protected against air attack as any capital ship could be. Her decks had the thickest possible armament. She had sixteen 4-in. anti-aircraft guns and sixteen others of smaller calibre. Her main armament was eight 15-in. guns and twelve 5.9-in. guns, and there were two catapults for aircraft. She was a vessel of 45,000 tons, 792 ft. long, with a speed of 30 knots and was completed in 1941.

The U-boat menace was very greatly reduced in 1944—so much so that in one month of the year only one ship was lost, while in seven other months the number sunk was negligible. Up to the middle of the year the Ger. had lost since the beginning of the war more than twice as many U-boats as in the First World War, the total up to Aug. 1944 exceeding 500—the war memorial at Kiel recorded the loss during the First World War of 198 U-boats. In one month of 1944 (July) the number of U-boats destroyed was substantially greater than the number of merchant ships sunk by them. In March five Brit. sloops (*Wild Goose*, *Mapple*, *Starling Kite*, and *Woodpecker*) on escort duty destroyed six Ger. submarines in the space of twenty days, in one case capturing the whole crew of fifty-one of one large U-boat. Some seventeen U-boats were sunk while attempting to interfere with the Anglo-Amer. cross-Channel traffic since the first landing of the Allies on the beaches of Normandy. While the Ger. U-boat fleet was then still of impressive size, the U-boats were now the hunted rather than the hunters; for they had been attacked from the Arctic to the Indian Ocean, aircraft playing a great part, together with surface forces. This pressure was maintained until all chances of revival of the U-boat campaign were killed and this despite the development of new devices and methods by an ingenious and scientific enemy.

Naval Operations in European Theatre of War in 1945. 'Admiral Scheer' and 'Lützow' sunk. The Ger. pocket battleship *Admiral Scheer*, was sunk in an attack on Kiel by aircraft of the R.A.F. Bomber Command on the night of April 9, 1945. She was turned completely upside down in much the same position as the *Tirpitz* in Tromsø Fjord. She was the second of the three pocket battleships to be put out of the war, the first being the *Admiral Graf Spee* (q.v.). Germany's last pocket battleship, the *Lützow*, was sunk on

April 16 by a small force of Lancasters in an attack with 12,000-lb. bombs at Swinemünde. The *Lützow*, formerly the *Deutschland*, was observed in Danzig Bay at the end of March, but the capture of Danzig by the Russians compelled the Gers. to move the ship further W. and she was attacked very soon after, being detected at Swinemünde. Like the *Admiral Scheer* the *Lützow* was used for commerce-raiding early in the war and, later, moved to Norwegian harbours for use against Brit. convoys to Russia. She was torpedoed by a Brit. aircraft off the Norwegian coast in June 1941 and again by midget submarines in Alten Fjord in Sept. 1941.

Ger. Ships captured in the Port of Copenhagen.—The last two big Ger. warships still seaworthy at the end of the European war, the cruisers *Prinz Eugen* and *Nürnberg*, were found by Brit. cruisers lying in the N. port, Copenhagen, with their Ger. crews on board. They had evidently made no attempt to flee when Denmark was liberated by the Brit. forces. Only a few days previously they had been shelling Copenhagen. With them were three destroyers, two torpedo-boats, ten minesweepers, thirteen 'flak' ships, nineteen armed trawlers, and two armed merchant ships. Two Brit. cruisers, *Birmingham* and *Dido*, and four destroyers, having forced a passage through Ger. minefields in the Skagerrak and Kattegat, came in prepared to attack, but the *Prinz Eugen* was a defeated ship and there was no opposition. Altogether about 135 warships of various types and some 600,000 tons of merchant shipping were captured in Copenhagen, which in the later period of the war was used extensively by the Gers. for troop-transport to Norway and for the evacuation of wounded from the Russian front.

Toll of Midget U-boats.—During the closing months of the war the Ger. Navy made extensive use of midget U-boats in a determined but vain attempt to interrupt the flow of allied supplies across the Channel and the North Sea to the Continent. In the course of a series of actions, fought mainly in coastal waters, some eighty-one midget U-boats were either sunk or captured. A further twenty-eight were possibly sunk. Attacks were also carried out on seventy others, but it was not possible to observe the full results of these attacks. After the capitulation of Germany about 100 more midget U-boats were captured. The Gers. employed three types of these boats, the *Biber*, *Molch*, and *Seehund*. The *Biber* was a one-man U-boat, 29 ft. 6 in. long, armed with two electric torpedoes and propelled by petrol engine and electric motor. The *Molch*, also a one-man boat, was approximately 46 ft. long, but had a similar armament to that of the *Biber* and was electrically propelled. The maximum speed of both was about 6 or 7 knots and the average human endurance ranged from 24 to 48 hrs. only. The *Seehund* was a two-man boat and, unlike the other two types, was well designed and equipped. It was in fact a miniature

pre-fabricated U-boat, 39 ft. long, with a displacement of 16 tons, propelled by Diesel engine and electric motor and had a surface speed of 8 knots with a submerged speed of 3 to 4 knots. The armament was two 21-inch modified electric torpedoes fitted with magnetic pistols and net cutters. It had an estimated performance of 18½ knots up to 6000 yds. and an approximate endurance of 275 m. at 8 knots surfaced plus 50 m. at 3 knots submerged.

Summary of U-boat Losses in the Battle of the Atlantic.—With the surrender of Germany the grim battle of the Atlantic ended. It had been a long-drawn, relentless struggle extending over nearly six years and one which demanded not only the utmost courage and endurance, but also the highest scientific and technical skill. Losses were heavy both in lives and materials and, at the peak in 1941 and 1942, the issue of the struggle hung in the balance. On the other hand 662 U-boats were destroyed and many others were destroyed by the Gers. themselves in the final stage. Most of these successes were achieved by the combined allied naval and air forces working in the closest co-operation; others were due to mines laid from aircraft and ships; others to bombing in harbour, and a few U-boats were lost by marine perils.

Up to 1943 the rate of shipping destroyed in the battle of the Atlantic in relation to the number of U-boats lost had been very favourable to Germany, but in the first four months of 1943 allied counter-measures began to make themselves felt and U-boat losses mounted rapidly. R.A.F. Coastal Command and escort carriers of the R.N. provided air cover on a scale which could not be matched by the Gers., and in April the allied chiefs of staff initiated a series of combined sea and air offensives directed against U-boats in the bay of Biscay. Doenitz (*q.v.*) was to be attacked in his own waters. The result of these and other allied operations was that in the month of May 1943 thirty-seven U-boats were sunk, representing approximately 30 per cent of all U-boats at sea. Doenitz was forced to withdraw his U-boats from the N. Atlantic, and on June 21 allied ships of 15 knots or over were able to resume transatlantic passages, independent of convoy protection.

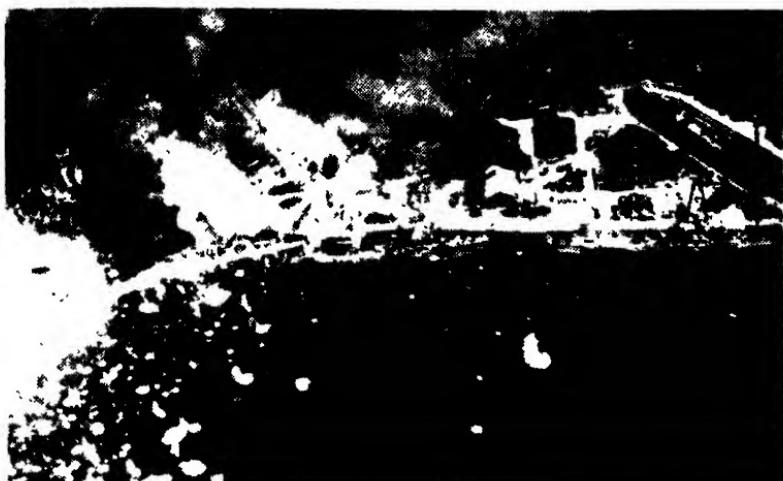
British Submarines in the War.—During the war Brit. submarines caused the following enemy losses: 6 battleships damaged; 6 cruisers sunk and 15 damaged; 12 destroyers sunk and 18 damaged; 46 U-boats sunk or probably sunk; 112 minor war vessels sunk and 26 damaged. That is the summary against warships alone, but the part played by Brit. submarines was often concerned chiefly with the interruption of the flow of reinforcements and supplies to enemy forces overseas. In this form of warfare Brit. submarines sank 1373 enemy supply and troopships, totalling 2,100,000 tons, and damaged a further 263 ships in these classes, with a tonnage of 790,000 tons.

British Naval Losses in the War against

Germany and Italy.—The Brit. Navy lost 730 ships during the war in the W., and the dominions forty-six others. Brit. losses included the capital ships *Royal Oak*, *Hood*, *Prince of Wales*, *Repulse*, and *Barham*, and the aircraft carriers *Courageous*, *Glorious*, *Ark Royal* (q.v.), *Audacity*, *Hermes*, *Eagle*, *Avenger*, and *Dasher*. There were also lost 134 destroyers, 77 submarines, 23 cruisers, 51 mine-sweepers, and 48 drifters, but numerically the highest losses were 240 trawlers. These totals do not include light coastal craft, and landing ships and craft. Losses of

became a co-belligerent are included in these figures. Fr. ships are included up to the collapse of France in June 1940. After that date Free Fr. ships are included, but not Vichy ships.

American Troop Losses at Sea.—Ship sinkings or damage to ships cost the lives of 3604 Amer. soldiers in the war against Germany and Italy, i.e. in the African, Mediterranean, European, and Atlantic areas, but excluding casualties suffered during the invasion landings. Official returns show that of 4,453,061 Amer. troops who embarked in the U.S.A. for



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THE LAST BLOWS AT JAPAN

An effective attack by naval Avengers on Shannosu shipyard, Injo Shima, Inland Sea.

naval ships, ships of all sizes and sorts, amounted to 3282.

Allied Merchant Marine Losses in the War against Germany.—During the war some 4280 allied merchant ships, totalling 19,720,000 gross tons, were lost by enemy action. Of these 2570, totalling 11,380,000 tons, belonged to the Brit. Empire. Neutral countries lost 190 ships, totalling 1,420,000 tons. U-boats accounted for 2770 ships, of which 1360 were Brit., 440 Amer., 670 other allied, and 300 neutral. 520 ships were lost through mines, including 310 Brit. and 15 Amer. The total losses through attacks by surface raiders were 330—including 210 Brit. and 13 Amer. Hostile aircraft sank 750, of which 110 were Brit. and 58 Amer. Some 400 vessels, including 220 Brit. and 12 Amer., went down through other or unknown causes. Altogether the U.S.A. lost 538 ships, totalling 3,310,000 tons, and the other Allies, excepting the Empire, 1172 ships, totalling 5,030,000 tons. In addition the Brit. Empire lost 610 ships of 1,120,000 gross tons. Losses of It. ships after Italy

Europe, 1094 were lost at sea outbound. Assuming, however, that every soldier had to make at least two sea voyages, thus doubling the risk, it works out that, of every 10,000 embarked, four were lost at sea, a figure which compares favourably with the First World War losses of 7·2 out of every 10,000. This comparatively small loss was due to the work of the allied navies, the vigilance of convoy escorts, and to the skill of the gun crews on the transports. The sinking involving the heaviest loss was that of the *Rohne*, a Brit. troopship, sunk by air attack in Nov. 1943 off Jidelli, Algeria. Bomb damage and the heavy seas and darkness hampered rescue, resulting in a loss of 1015 men, more than half of the total complement of Amer. soldiers on board.

Naval Operations in the Far East in 1945.—The beginning of the year saw the U.S. Navy actively supporting the re-capture of the Philippines. In the bombardments previous to the landings in the Lingayen Gulf on Jan. 9, Australian naval forces took part with those of the U.S.A. On Feb. 16 the Amer. advance

across the Pacific reached the mainland of Japan when a naval force moved up to within 300 m. of Honshu and subjected Tokio and Yokohama to 9 hrs' bombing by 1500 aircraft from about twenty carriers. This was followed by two further heavy raids towards the end of the month, when naval aircraft were supported by 200 Superfortresses. Meanwhile on Feb. 19 Amer. forces assaulted the is. of Two Jima with massive naval and air support, but the is. was not won until March 16, at the cost of 20,000 Amer. casualties, including over 1000 killed. The Brit. Pacific fleet now began to operate as a separate Brit. unit under Amer. command. It included five capital ships and four large carriers, besides numerous cruisers, destroyers, and other craft, and one of its first operations was an attack with Amer. naval aircraft on is. between Formosa and Japan. Attacks by 1500 allied aircraft were also made on the Jap. fleet in its home waters. On April 1, in the largest amphibious operation up to date, troops landed on Okinawa after a crushing naval bombardment and under an air umbrella of 1500 aircraft. The left flank was covered by a powerful Brit. naval force. In strong counter-attacks, the allied fleet suffered loss and damage from Jap. suicide aircraft. Meanwhile a fast Amer. task force brought a Jap. naval force under air attack, sinking the battleship *Iamus*, and Brit. carrier aircraft attacked Formosa. Throughout May hard fighting continued at Okinawa which was not finally captured until June 21. This gave the U.S. air force a base only 325 m. from the Jap. mainland. In the S.W. Pacific Australian forces supported by allied naval units had landed in N. Borneo and New Guinea, to be followed in June by the capture of Labuan Is. On July 14 Japan itself was subjected to the first naval bombardment when Amer. warships poured 1000 tons of shells into the port of Kamaishi (Honshu). Thereafter bombardments by Brit. and Amer. surface forces alternated with joint attacks by as many as 1500 naval aircraft. Towards the end of the month Brit. and Amer. air attacks were concentrated on the remnants of the Jap. fleet sheltering in the Inland Sea and, in three devastating assaults, did immense damage both to ships and shipyards. Shattering sea and air bombardments of the mainland continued in Aug. and were quite independent of the atomic bombs dropped on Aug. 6 and Aug. 9. On Aug. 15 allied aircraft were starting a further attack in the Tokio area when the cease fire order was received. Japan had surrendered. On Aug. 27 a large allied fleet, under the supreme command of Adm. Halsey, U.S. Navy, arrived in Sagami Bay and Adm. Sir Bruce Fraser signalled to the Admiralty: 'The fleet has anchored in Japanese waters.' Of the Jap. Navy there remained afloat only one battleship out of thirteen, and that was damaged, two severely damaged aircraft carriers out of twenty-one, four damaged cruisers out of forty. Jap. destroyers had been

reduced from 165 to 26, and her submarines from 140 to 16. No fleet had ever been more thoroughly defeated.

The Navy's Sacrifice.—In the whole course of the war nearly 51,000 officers and men of the R.N., excluding the navies of the dominions and the Royal Marines, were killed or missing. This number exceeded by over 20,000 the numbers killed in the First World War.

The more spectacular victories and successful actions fought at sea were really but a small part of the R.N.'s great contribution to the overthrow of Nazi tyranny; its real task lay in the unceasing vigilance, devotion, and toil that went to the maintenance of the sea communications of the Empire and Allies throughout the war. The navy's losses in this war were two and a half times as great as they were in the First World War, and losses of merchant shipping amounted to the figure of 20,000 tons a day for most of 1942. The magnitude of the navy's task is well illustrated by the fact that 998 U-boats were destroyed, an average of one every second day throughout the war. Of these U-boats one-third were destroyed within 500 m. of the United Kingdom. See F. Taprell-Dorling ('Traffair'), *Western Mediterranean, 1942-1945, 1947*; G. Stitt, *H.M.S. 'Widewake'*, 1943, and *Under Cunningham's Command*, 1941; Adm. Sir W. M. James, *The British Navies in the Second World War*, 1946; W. E. Benyon-Tinker, *Dust upon the Sea*, 1947; R. Grenfell, 'The "Bismarck" Episode', 1948; S. E. Morison, *The Battle of the Atlantic, 1939-1941*, 1918; A. Martensen, *Hitler and his Admirals*, 1948; R. Langmaid, *The Med.: the Royal Navy in the Mediterranean, 1939-45*, 1948; D. Wemyss, *Wallace's Groups in the Western Approaches*, 1948; J. Cowie, *Mines, Minelayers, and Minelaying*, 1949; and J. C. Creswell, *Sea Warfare, 1939-1945*, 1949. The U.S. official naval history is in course of pub.

Naval Reserves. The reserves of the R.N. consist of: (1) The Royal Naval Volunteer Reserve (R.N.V.R.), which trains officers and men in their spare time. Some put in both evening and a period of ann. training with the fleet; others do the ann. training only. There are twelve R.N.V.R. divs.: London, Belfast, Hove, Dundee, Newcastle-on-Tyne, Bristol, Glasgow, Leith, Southampton, Liverpool, Hull, and Cardiff, and each div. has its own sea-going tender in which training cruises are carried out. In addition, the R.N.V.R. comprises four air squadrons: No. 1830 at Abbotsinch, near Paisley, No. 1831 at Streton, near Warrington, No. 1832 at Oldham, near Abingdon, Berkshire, and No. 1833 at Bramcote, near Nuneaton, Warwickshire. The present strength of the R.N.V.R. is 3000 officers and men, but the target is 15,000. (2) The Royal Naval Volunteer Wireless Reserve (R.N.V.(W.)R.), which trains officers and men in the techniques of naval communications at their homes and local centres. Two centres for this reserve have been estab. in London and Grimsby, but it is intended to open others

in another twenty-five tons. The target for the R.N.V.(W.R.) is 1250 officers and men. (3) Royal Naval Volunteer Supplementary Reserve (R.N.V.(S.R.)), comprises ex-temporary naval officers willing to serve in an emergency. No training is required. (4) Royal Naval Emergency Reserve (R.N.E.R.), estab. in 1949 for ex-naval ratings willing to serve in an emergency. No training is demanded. The target for this reserve, combined with the R.M.E.R. (see below), is 50,000. (5) Royal Fleet Reserve (R.F.R.), open to men with a minimum of three years' service in the R.N. or Royal Marines. It carries retaining pay of 1s. to 1s. 6d. a day according to rating and demands seven days' continuous training every two years. The intake (1949) is 700 per month, but it is desired to raise this to 1000. Provision was made in the 1949-50 estimates for an R.F.R. of 25,000. (6) Royal Naval Reserve, filled by officers and men from the Merchant Navy. (7) The Royal Naval Patrol Service supplied by the fishing fleets. The reconstitution of (6) and (7) is under consideration (1949). Note: All officers of the R.N. on retired pay are automatically on the reserve and liable to be called up in an emergency. (8) Royal Marine Forces Volunteer Reserve (R.M.F.V.R.) is the first auxiliary reserve of the Royal Marines, and the first two centres opened in London and Glasgow in Nov. 1948, two more in Liverpool and Bristol in 1949. Still more are intended. This reserve is run on the same lines as the R.N.V.R. and the initial requirement is 1500 officers and men. (9) Royal Marine Emergency Reserve (R.M.E.R.), a new Reserve (1949) of ex-Royal Marine officers and men willing to serve in an emergency. No training is demanded (see also R.N.E.R. above). (10) Women's Royal Naval Reserve (W.R.N.R.), comprises a list of ex-W.R.N.S. officers and ratings, with a minimum of one year's service, willing to serve in an emergency. Its strength (1949) is 3200, but a target of 10,000 is the aim.

Naval Scientific Service, Royal, comparatively new branch of the R.N. retained after the Second World War as a permanent service. During the First World War there were great developments in the application to warfare and the Admiralty found it necessary to bring in scientists to co-operate in the development of wireless, mines, gunnery systems, and devices for all sorts of purposes. The lesson of all this was quickly appreciated and a decision taken to retain in being a number of the experimental organisations which had sprung up during that war, and a number of the scientists in those organisations were persuaded to stay on permanently. The Admiralty Research Laboratory was built at Teddington, and the staff scattered about in the various estabs. were brought under a single grading system and organised in what were known as the Admiralty Scientific, Technical, and Chemical Pools. During the inter-war period the situation remained comparatively static. Personnel was slightly increased during and after

the Abyssinian crisis of 1935, but it was not until 1939 that any substantial change took place. The Second World War being recognised as a scientist's war, the naval scientific organisation expanded correspondingly and the personnel increased tenfold over the 1935 level and even then could not cope with all its tasks adequately. The old permanent corps was reinforced by scientists of all kinds drawn from every source. The achievements of this force were great and may be exemplified in the speedy mastery of the magnetic mine, and in other services the nature of which may not yet be divulged. The net result was that the Board of Admiralty was impressed with the need to give more adequate recognition in its organisation to the scientific arm, and in Sept. 1944 they announced their intention to establish after the war the R.N.S.S. This was done in 1946 when the post of chief of the R.N.S.S. was created, with the oversight of four new depts., each under a scientist of the status of full director. Thus to-day the R.N.S.S. holds a very central and important part in the Admiralty organisation.

The scope of the work of the R.N.S.S. is of the widest, covering research and development of every kind in physics, chem., and engineering by way of promoting the fully up-to-date fighting efficiency of the navy. The greater part of the work of the R.N.S.S. is concerned with ships. In addition to ordinary seaworthy naval vessels must be capable of withstanding altogether abnormal stresses and strains from attack by guns, torpedoes, and mines and bombs. The effects of blast and explosion, both on the surface of the sea or beneath, pose most difficult problems, in the solution of which the scientist can help the constructor. Again, the requirements of warships' and submarines' engines are stringent as compared with those of the mercantile marine and the problems correspondingly greater. There is also the problem of communications offering the widest field for the telecommunications engineer in radio reception, transmission, and direction-finding. As a further example of the value of the work done by the R.N.S.S. may be mentioned the fact that the navy possessed the Asdic device for countering the submarine menace at the outbreak of the Second World War, and throughout the war the R.N.S.S., in co-operation with certain univs. and industrial laboratories, kept the lead in the field of thermonic tubes, a success which was a major contribution to winning the war. The practical work of the R.N.S.S. is applied to civil life in industry in many ways. Examples of this are the development of the spectrographic method of analysis, which has in many cases replaced the old chemical method, and the application of radar as a navigational aid to the mercantile marine.

In the R.N.S.S. there are two main officer divs., the first consisting of the scientific officer grades, the second the experimental officer grades. The normal qualification for the scientific officer is a

first- or second-class honours degree and the entry rate of pay for officers without post-graduate experience is £100 a year. Following a satisfactory probationary period, a scientific officer may expect promotion to the senior scientific officer (S.S.O.) grade (£700-£900) and to the prin. scientific officer (P.S.O.) grade (£950-£1250), which he should reach in the early forties. Satisfactory entrants may expect to reach the senior (S.P.S.O.) grade (£1320-£1520) before the end of their careers. There is an appreciable number of posts in the deputy chief (D.C.S.O.) grade (£1600-£1800 and at £2000) and a very limited number at still higher pay. Special provision is made for what are known as 'special merit' appointments in the S.P.S.O. grade and very exceptionally in the D.C.S.O. grade for outstanding individual workers without any administrative responsibility. The experimental officer class is open to individuals with minimum qualifications of intermediate degree or higher national certificate. It is in three grades and pay ranges from an entry rate (£230-£390) rising to £490. The top grade is the senior experimental officer (S.E.O.) with a pay range of £735-£935. See 'The Royal Naval Scientific Service,' by F. Brundrett, in *The Central*, No. 99, June 1949.

Naval Treaty of London (1936), treaty concluded on March 25, 1936, between Great Britain, U.S.A., and France with a view to limiting naval armaments. It had been agreed under the provisions of the London Naval Treaty, 1930, to meet in conference in 1935 to frame a new agreement to replace and carry out the purposes of that treaty. As Japan had given notice of termination of the Washington Treaty (q.v.) it was necessary to summon a conference for that contingency too. The conference of 1935-1936, however, could come to no agreement on quantitative limitation. At the opening Japan tabled her proposal for a 'common upper limit,' but, as this was not acceptable to the other delegations, Japan withdrew from the conference. The further efforts of the conference were therefore directed to achieving the maximum measure of qualitative limitation and to obtaining agreement on provisions for advanced notification of construction programmes. The chief limitations agreed on were: capital ships, maximum displacement, 35,000 tons, maximum gun calibre, 14 in.; aircraft carriers, 23,000 tons, 6-1-in. guns; submarines, 2000 tons, 5-1-in. guns; together with provision for 8000-ton cruisers with 6-1-in. guns. The treaty framed on this basis came into force on Jan. 1, 1937, and was to remain in force until the end of 1942. It meant but little in the way of real limitation, for not only did it lack the adherence of both Italy and Japan, but it had 'escape' clauses allowing of earlier limitations if, in the meantime, the naval programmes of other nations should threaten the security of signatories. As Japan refused to reveal her programme and was reported to be building battleships of 40,000 tons, the three London

signatories raised the limit for capital ships to 40,000 tons by announcement on June 29, 1938.

Navan, prin. tn. of co. Meath, Eire, situated at the junction of the Boyne and Blackwater, 30 m. N.E. of Dublin. It manuf.s agric. equipment, carpets, furniture, and woollen goods. Pop. 4500.

Navarrete, Juan Fernandez (1526-79), surnamed El Mudo (the Mute), Sp. painter, b. at Logroño. It is supposed that he was pupil of Titian at Venice. In 1568 he went to Madrid as salaried king's painter to Philip II., and painted in the Escorial the three pictures of 'The Nativity,' 'The Baptism of Christ,' and 'Abraham receiving the Three Angels.'

Navarino, Pylos, or Neocastro, fortified seaport of Greece, on Navarino Bay, in the prov. of Messenia, 56 m. S.W. of Tripolis. To the N. are situated the ruins of the ancet. Pylos. In the bay the Eng., Fr., and Russians united for the protection of Greece, and defeated the Turkish and Egyptian fleets (1827). See also PYLOS.

Navarra, or **Navarre**, prov. of Spain (formerly a kingdom with ter. to the N. as well as S. of the Pyrenees), is bounded on the N. by France, on the E. by Aragon, on the S. by Old Castile, and on the W. by the Biscays. Area 4056 sq. m. Pop. 371,500. The country is mountainous, being bounded and traversed by the Pyrenees, spurs of which occupy almost the whole of the prov. in its N. and E. parts. The highest peaks are Altovisear, Adi, Alcorrunz, and Runa. Navarra is watered by the Bidassoa, the Ancezo, and by the Ebro, together with its trib., the Ega and Aragon, on the level shores of which corn, wine, and oil of good quality are produced. Some of the valleys which intersect the mt. ranges, as those of Roncesvalles, Lescon, Bastan, and Roncal, have a fruitful soil and yield good crops; but in the mt. dists. husbandry is impracticable. The manufs. include textiles, soap, candles, leather, and paper. Iron, silver, lead, copper, and salt are the chief mineral products of the dist. The chief tn. is Pamplona (q.v.).

The ter. known from an early period of Sp. hist. under the name of Navarra was occupied in ant. times by the Vascones, who were subdued by the Goths in the fifth century. After having become gradually amalgamated with their conquerors, the people continued to enjoy a species of turbulent independence under military leaders until the eighth century, when they were almost annihilated by the hordes of Arabs who were rapidly spreading their dominion to all parts of the peninsula. In 1285 it became an appanage of the Crown of France, and continued a part of that kingdom during the successive reigns of Louis X., Phillip V., and Charles the Fair; but on the death of this last in 1328 France fell to the family of Valois, and the daughter of Louis X., the rightful heir, succeeded to Navarra as Joanna II. Ferdinand seized Sp. Navarra in 1512, when it became part of Spain, and the small strip of ter. on the N. of the Pyrenees became merged in the Crown of France. After this act of spolia-

tion the kingdom of Navarra was reduced to the ter. N. of the Pyrenees, which was subsequently united to the Crown of France by Henri IV, of Bourbon, king of Navarra, whose mother, Jeanne d'Albret, was granddaughter of Queen Catharine, and hence the hist. of Navarra as a kingdom ends with his accession to the Fr. throne in 1589. The Navarrese S. of the Pyrenees were permitted to retain many ancient municipal charters and constitutional privileges, after their incorporation with the other dominions of the Sp. Crown, and these prerogatives were not taken from them till the reign of Queen Christina, when the active aid which they had furnished to the Pretender, Don Carlos, drew upon them the ill will of the gov.,

is generally the highest portion of the building. The term was anciently used to include the aisles, denoting all the part used by the laity.

Navew, or **Navet**, name for sev. cruciferous plants which, originally classified together as *Brassica campestris*, were divided by Sir Joseph Hooker into three sub-species, *B. rapa*, from which the turnip is derived; *B. rutabaga*, swede turnip; and *B. napus*, rape. The difference in the varieties probably results from the objects and methods of cultivation, whether for fleshy roots or oily seeds.

Navicert, system of naval control of neutral trade in time of war. The N. system implied the examination in neutral ports of outgoing cargoes and the issuance



NAVARRA: ESTELLA

and led at the close of the Carlist war to the abrogation of their *fueros*, or national assemblies, and to the amalgamation of their nationality with that of the kingdom at large. See P. Boissonade, *Histoire de la réunion de la Navarre à la Castille*, 1893, and L. de Uribayon, *Geografía humana de Navarra* (Pamplona), 1929.

Navarrete, Martín Fernández de (1765-1844), Sp. scholar and naval officer, b. at Abalos. He entered the navy in 1780, and became a captain in 1796. From 1789 to 1792 he was appointed to collect documents relating to the hist. of the sp. Navy; he was made director of the hydrographic dept. in 1823, and senator and director of the Madrid Academy of Hist. in 1837. His works include *Colección de los Viajes y Descubrimientos que hicieron por Mar los Españoles desde fines del Siglo XV.* (1825); *Disertación sobre la Historia de la Náutica* (pub. 1848); and *Biblioteca Marítima Española* (1851).

Nave, in eccles. architecture the main central div. of a church, having aisles on either side. It is separated from the aisles by rows of piers or columns and

of certificates to those free of contraband which would facilitate their passage through the naval control. The originator of the N. was Mr. Skinner, U.S. consul-general in London during the First World War, but the system adopted in that war in 1916, and which was revived in the early part of the Second World War to reinforce the system of control ports from Kirkwall to Haifa, differed in certain essentials from that which was in operation for the rest of the Second World War. The position in the Second World War was governed by the order in council of July 31, 1940, which provided that 'any vessel on her way to or from a port from which goods might reach or come from enemy territory or the enemy armed forces, not being provided with a ship navicert valid for the voyage on which she is engaged, shall, until the contrary is established, be deemed to be carrying contraband or goods of enemy origin or ownership, and shall be liable to seizure as prize'; and also that 'all goods consigned to any port or place from which they might reach enemy territory or the enemy

armed forces, and not covered by valid cargo navicert . . . shall, until the contrary is established, be deemed to have enemy destination.' The effect of these provisions was that any neutral shippers or shipowners who shipped unnavicerted cargo to or from European ports did so at their peril. They ran the risk of losing both cargo and ship. Also under the provision of the ship warrant scheme, the offending owner was liable to lose not only the warrant in respect of the particular ship concerned but also in respect of any other vessel in his possession.

Navicular Disease, or Groggy Lameness. Inflammation and ulceration of the N. or shuttle-bone of the horse, invariably occurring in the forefoot, and due sometimes to hereditary causes or to overwork on hard roads, but more commonly to driving at excessive speed after the horse has been kept for some time without exercise. The inflammation causes a constant irritation in the foot, which sets up an extra growth of horn; the removal of this, and frequent shoeing, for preference with an India-rubber bar pad, and short shoe, affords much relief and enables the animal to work tolerably well, but the disease is practically incurable.

Navigation, name applied to the science of finding the position of a vessel at sea (or of an aircraft, as to which see AERIAL NAVIGATION) and so directing her from one point to another. During practically the first fifteen centuries of the Christian era sailors, such as the Phoenicians, the Carthaginians, Gks., and Romans, depended entirely upon their observation of the skies and their proximity to the coast, out of sight of which they seldom ventured. The Vikings probably did most of their navigating under similar conditions, and their discovery of Iceland, and possibly of America, was a result of their being blown out of sight of land and of their inability to direct themselves. During the Renaissance the science of N. became a more or less exact one. This was due very largely to the discoveries of the Portuguese sailors and more especially to the work of Prince Henry the Navigator. The cross staff, an invention by which long could be determined, was first made by Werner about the beginning of the sixteenth century, and, later, chronometrical observation in conjunction with the use of nautical instruments came into general use. Davis invented a back staff which seems to have been very generally accepted and this form of quadrant remained in use for a very long time. Much about the same time an instrument came into use for the determination of the height of the sun and stars (the astrolabe). The inventions and discoveries of Mercator did much to make N. more a matter of exactness. The inventions of Wright did much also in this direction, and finally towards the beginning of the seventeenth century arithmetic, trigonometry, and logarithms began to be used as methods of calculation. Probably the greatest work of this century was that of Martin Cortes, whose book was accepted as authoritative. Amongst

Eng. books on this subject may be mentioned—Cunningham's, *Cosmography and Navigation*, the work of Davis and Mercator, and in 1751 J. Robertson's, *The Elements of Navigation*, 1796. The foundation of the Royal Observatory at Greenwich by Charles II. in 1675 was the direct result of the need for a reliable method of determining the position of a ship at sea. In 1763 the *British Mariner's Guide* was pub. by Dr. Maskelyne, and this really was the nucleus of the *Nautical Almanac*, which was first pub. in 1766 for the year 1767. Pub. has continued without interruption since that time. The author of the *British Mariner's Guide* had also, two years previous to this first pub., discovered a method by which long. might be determined by lunar observation.

PRACTICAL NAVIGATION: COASTAL. In navigating a vessel along a coast the exact position is usually ascertained by reference to points of land, lighthouses, and beacons in conjunction with a chart of the vicinity. When it is possible to refer to more than one point the position is easily ascertained, because a ship's position is where compass bearings, after correction for deviation, intersect on chart. When only one point is available a bearing can be taken provided a sextant angle of the point or headland is also taken in daylight and the height of the point is shown on the chart. Another method adopted is to take a bearing of a point and then continue the vessel in the same course for some distance, at the end of which time another bearing is taken and these two bearings are marked down on the chart. By means now of a parallel rule placed in the same direction as the ship's course, it is possible to find and mark the exact position of the vessel when any current or leeway or both has been allowed for. Another variation of the foregoing methods of finding the position of the vessel is known as the 'four point bearing.' This is used when the ship is 'abeam' of the point of which observation is being made. A bearing is also taken when the point is four points on the bow. When it is possible to take observations of two points, these observations are taken simultaneously and marked on the chart; the point of intersection is the position of the vessel. With three points in view an instrument called a station pointer is used, and the angles between them found by means of its three arms. These three arms are attached to a circle made of celluloid, and when the arms have been placed in such a position that they correspond with the angles between the points, it is placed on the chart, and the centre of the circle gives the exact position of the vessel. In coastal N. when the weather is foggy the ship is navigated by means of 'feeling' round the coast with the lead or sounding machine (see *Modern Ocean Navigation* below). Naturally this is the most unsatisfactory of all methods, and soundings have to be continually taken in order to get even an approximate position. When using this method it is necessary to know the state

of the tide (*see TIDES*) and to reduce the soundings to low water, as all depths shown on a chart are given at low-water spring tides. In order to assist vessels safely to negotiate narrow channels when entering or leaving harbour, the leader system has been devised. A cable is laid along the sea bed in the channel and an alternating current is caused to flow through it. The constant variation in the current causes the magnetic field round the outside of the cable to vary in sympathy, with the result that radiations are produced which may be picked up by suitable apparatus on board ship. Two sets of coils are placed one on each side of the vessel and so arranged that they can be connected to earphones. By the strength of the signals from one side or the other it is possible to determine on which side of the cable the ship is passing; when directly over the cable the signal strength is the same from both telephones. In its latest form, instead of telephones a small pointer is fitted which definitely indicates the ship's position relative to the cable.

It is necessary to bear in mind that all bearings taken from the compass must be converted into magnetic bearings before being marked on the magnetic chart, and even if the chart is a 'true' one, variation must still be allowed for. A bearing may be best defined as an observation by compass of the direction in which a point lies from the vessel.

Modern Ocean Navigation. The increase both in the size and the speed of ships has led to many developments in the science of N. Problems formerly regarded as purely theoretical have within recent years become very practical, and the science of N. to-day is much more intricate and precise than it was some decades ago. A long ocean voyage is first mapped out as carefully as possible on a great circle chart, the shortest possible route being chosen. The track thus chosen is followed also on a chart which shows probable wind directions and currents, and is modified according to the information therein given. In addition the track chosen would be also modified by such information as navigator's books relating to that region would give, and by the information supplied by the Admiralty's *Ocean Passage Book*. Next the route would be transferred from a great circle chart to a Mercator's projection chart, on which the great circles are shown, for convenience, sake, as straight lines, whilst the 'rhumb' line (the representation of the N. of the ship) is shown as a curved line. All meridians and the equator are shown on Mercator's projection as straight lines. The great circles are not followed in the steering of the ship; each circle is divided into chords which are followed instead, since that means only the alteration of the course by one or two degrees at the end of each chord, whereas to follow the great circle would involve the constant changing of the course. The general track to be followed having already been laid down, there are three methods by means of

which it is possible at any point during the voyage to ascertain the exact position of the vessel. These are: (1) The recording of the track on charts, a difficult matter owing to the constant errors which creep in and which cannot well be avoided; (2) by trigonometrical calculation, which is based on the course steered and the distance run; (3) by astronomical observation. As long as the ship is in sight of land, those methods which have been described under the heading coastal N. are used. In rough or hazy weather continuous soundings are taken when in localities which are known to be dangerous, and it is necessary to remember that the soundings must be continuous, since an occasional sounding is more dangerous than useful. Lord Kelvin's sounding machine, which is still used for that purpose, consists essentially of a drum round which is coiled say, thousand fathoms of fine wire, the free end carrying a specially designed sinker or lead (*q.v.*) which will enable a sample of the ocean bed to be brought to the surface. The wire passes over a registering wheel which indicates on a dial the length of wire run out. Two brakes are fitted to the large wire drum, one to control its rotation and the other automatically to stop the mechanism when the sinker reaches bottom.

A more modern method of ascertaining the depth of water is by echo-sounding. Broadly this is done by producing a sound in the water near the surface and accurately measuring the short interval of time which elapses before the echo reflected from the bottom is heard. This system requires sensitive time-recording instruments, but has the advantage that sounding can be conducted in all weathers at any speed of the vessel. During these periods the coast chart is used, this being on a very much greater scale than the ocean chart, which is usually known as the small scale chart. Before losing sight of land the lat. and long. (*q.v.*) are calculated by means of the methods already described, and the exact position is transferred from the coast chart to the small scale chart. After this the position of the ship is calculated by the methods given under the heading (2) above. This method is rectified wherever possible by means of astronomical observation and by a calculation of the changes of lat. and long. by means of plane trigonometry, frequent use being made of the traverse tables. These methods of discovering the exact position of a ship are known as dead reckoning, and the modern ship's compass, patented by Lord Kelvin, has done much to ensure its accuracy. The distance run by the ship is obtained by the patent log, the hand log being regarded nowadays as giving only the roughest estimate of the distance run. Nor is the patent log regarded as entirely accurate, the distance run by the ship being calculated more accurately nowadays by the number of revolutions of the engines. The most accurate means of ascertaining the exact position of the ship, however, is by astronomical observation,

and this is always employed wherever possible. Dead reckoning is only used during bad weather conditions. The astronomical observations are attended by many difficulties. The instrument used for making these observations is a sextant (q.v.); but this, owing to the conditions under which it has to be employed, must give rise to some little error. Navigators attempt, and to a great extent succeed, in rectifying such error by taking the average result of a number of observations made at different times. One of the greatest marvels of modern N. is the reliance which can be placed upon N. by star observation. The most accurate of all observations is probably the twilight observation, when the brighter stars are just visible and the horizon is visible also. For this purpose the armillary sphere is employed. This is a small celestial globe on which is marked all the prin. stars visible to the naked eye. By manipulating the sphere which is elevated, until

sideral time is under the fixed meridian, a correct representation of the heavens is thus obtained. Astronomical observations are made at sea for the purpose of ascertaining lat., long., error of the compass, and lat. and long. simultaneously. The chief heavenly bodies observed are the sun, moon, Venus, Mars, Jupiter, Saturn, and the Pole star, together with all stars of the first magnitude. The *Nautical Almanac* gives the position of all these for fixed times at Greenwich, and gives also all necessary information for computing the position of these bodies at all times in all places. An important development is the application of directional wireless telegraphy to N., being particularly useful in foggy weather for establishing the position of a ship approaching the land. The principle of operation of a direction finder depends upon the fact that the antenna, or aerial, of a wireless transmitting or receiving installation emits or absorbs radiations most strongly in its own plane. In the direction finder used in practice the antenna consists of a flat coil of sev. turns of wire mounted on a vertical axis about which it is free to rotate so that its plane may be pointed in any direction of the compass. As a receiver it is turned until the signals are received at maximum strength, when it is known that the plane of the coil must point to the transmitting station. Direction-finding apparatus is either housed on land, when in response to a message from a vessel it can determine and signal to the ship its position; or it is carried on board and pointed towards a land station.

Another form is the rotating 'beacon.' This consists of a radio-transmitting station at some known point on land, having an antenna which is continuously rotated at constant speed and which is always automatically emitting a special Morse code signal. At a particular point in its rotation a characteristic signal is sent out. This system is declining in favour, although it has the advantage that no special wireless-receiving apparatus is required on the ship and the bearing can be taken on a broadcast receiver with the aid of a stop watch.

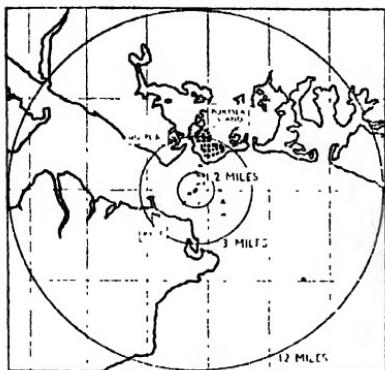
The gyroscopic compass has also been of great assistance to navigators. It has three important advantages: it is unaffected by magnetic effects of iron or steel in its vicinity; it always points to true or geographical north; and it is invaluable in high lats., where in a magnetic compass the card is straining to stand on its edge with consequent loss of efficiency. It is composed of a gyro-wheel rotated at high speed by electricity and this, if free to do so, will always set itself so that its axis lies in the true north and south meridian. A compass card and auxiliary parts are mounted on gimbals. The actual gyro-compass is mounted in a special room in the ship and repeaters synchronised with it are erected where required in other parts of the vessel. The gyroscopic compass is regarded by many seamen as the greatest of all modern aids to navigation.



SPERRY GYRO-COMPASS

The gyroscopic compass derives its north-seeking qualities from a combination of four natural laws, the first and second of which are properties of the gyroscope, the third gravitation, and the fourth the earth's rotation. These natural laws provide a source of directive force for a compass that indicates the true north and does so with a degree of steadiness comparable to that of an object on shore. In addition to indicating the true north, the Gyro-Compass is capable of operating, repeating, or indicating compasses wherever their indications may assist in navigating the vessel.

Sperry Gyroscope Co. Ltd.



NAVIGATION BY MARINE RADAR

Simplified plan or chart of the Solent, the strait between the Isle of Wight and Hampshire, England, showing "Ryde Pier and the surrounding coast-line. In this and the accompanying diagrams the ship's position is shown as a white circle in the centre of the plan or screen, and its direction is assumed to be north-east by north. The scale of display may be changed so that the screen covers 30, 12, 3, or 1½ nautical miles. The last three are shown by the concentric circles on the plan.



The illuminated 12-mile display on the radar screen of the Solent equivalent to the whole of the simplified chart at the left, as it would appear on the screen at a scale of approximately 1 inch to 1 mile. With the ship in the centre, the surrounding coast-line can be discerned as a recognisable pattern of light with its many indentations, harbour entrances, etc. On the port quarter an elongated pencil indicates Ryde pier, and surrounding buoys appear as several points of light.



DIAGRAMS OF PLAN POSITION INDICATOR (P.P.I.)

In this second diagram the range switch has been turned to the 3-mile position and the display thus brought up to the correspondingly larger scale of 1 inch to 1 mile. Surrounding objects are defined with greater clarity and detail. Reference to the circular range scales super-imposed on the chart of the Solent shows the area which is embraced by the 3-mile range in relation to the above diagram.

The 1½ mile position above gives an even greater expansion to the scale of the display, now covering the area within the smallest circle on the chart. The scale being 3 inches to 1 mile. Buoys are displayed with great accuracy. The thin bright line (thickened for the purpose of this reproduction) is the luminous ship's leading line, brought on the screen by a switch.

Cossor Marine Radar

Cossor Marine Radar

Cossor Marine Radar

Radar.—Radar (q.v.) is used for three main tasks in N.: (1) to provide warning of the approach of ships, icebergs, etc., and to avoid collisions; (2) to assist in the N. of coastal waters; (3) as an aid to the pilotage of restricted waters.

It is usual to provide scales of display so that the radar screen covers various ranges up to 30 nautical m., 12 nautical m., 3 nautical m., and 1/2 nautical m. A set should provide a clear indication of coast-lines at 20 nautical m. when the ground rises to at least 200 ft. and at 7 nautical m. when it rises to at least 20 ft. Ships should be seen at 7 nautical m., fishing vessels at 3 nautical m., and buoys at 2 nautical m. It has been found that by fitting buoys with corner reflectors the radar response can be increased to 8 or more nautical m. By means of a chart comparison unit the picture may be viewed in coincidence with a chart. Another method is to project a magnified image of a micro-film transparency of the chart on to the face of the plan position indicator (P.P.I.). Shore radar can be used for port and harbour supervision as it provides instantaneous information of movements in the port area. It is also of value in enabling the port authority to know whether buoys or light vessels have moved from their charted position in bad weather and, if so, to know their new position. The ports of Douglas (Isle of Man) and Liverpool are both fitted with radar and at the latter place the pilots carry portable radio telephones which enable the control staff on shore to communicate instructions and advice concerning the pilotage of the ship; this is of particular value in foggy weather or when unusual conditions exist. The Liverpool-Wallasey and Gravesend-Tilbury ferries are also assisted in bad visibility by shore radar in conjunction with a radio-telephone link. Experimental Rairmark beacons have been established at St. Catherine's, Isle of Wight, and Portland Bill lighthouses. When the ship's radar aerial points towards these places a broken bright line appears from the centre of the radar screen to its circumference on the bearing of Rairmark in relation to the ship. To enable the navigator to identify the Rairmark, small dots are used for St. Catherine's, large dashes for Portland Bill. The range of these beacons is 12-14 m.

Loran.—Long Range Navigational Air) employs pairs of pulse-transmitting stations spaced up to 600 m. apart. The pulses are received and displayed on a cathode ray indicator from which the operator can determine the difference in arrival time between the two pulses. The ship's position is determined by taking a path difference reading from two pairs of stations. The observations and plotting take about 5 min. and the range over the sea is approximately 700 m. by day and double this distance by night. This system was used extensively during the Second World War and the whole of the North Atlantic and the Pacific was covered by Loran.

Gee is similar to Loran and consists of a master and two or three shore stations sited up to 80 m. apart and emitting continuous series of synchronised radio pulses from omni-directional aerials. The range over the sea is 100-150 m. The equipment is comparatively simple to operate and a navigator can plot his position in a minute.

Debra, like Loran and Gee, employs the 'hyperbolic' system. A number of transmitting beacon stations have been erected in Great Britain and on the Continent and, by means of special receiving equipment in a ship and special navigational charts on which are superimposed a lattice of lines of position, the ship's exact position can be ascertained. The range is approximately 300 m. and this system is practically confined to ships employed in the home and coasting trades.

See S. T. S. Leeky, *Wrinkles in Practical Navigation*, 1890; F. C. Stebbing, *Navigation and Nautical Astronomy*, 1903; W. Hall, *Modern Navigation*, 1909; Ministry of Transport (H.M.S.O.), *Radar and Radio Position Fixing Systems for Marine Navigation*, 1946; and E. M. Robt., *Application of Radar to Seamanship and Marine Navigation*, 1949.

Navigation Acts, long series of Acts of a protective nature which have been passed from time to time to prevent foreign competition on equal terms with Eng. ships. Although these Acts date back to the time of Richard II., the chief Act was that passed under Cromwell in 1651, directed principally against the Dutch. This provided that imports should be brought into England only in Eng. vessels or in vessels of the country actually producing the goods, and Eng. exports carried only in Eng. ships, the object being to monopolise as far as possible the carrying trade of the world. This restriction also applied to any Eng. dependencies. To a very great extent these laws accounted for much of the trouble between Great Britain and Ireland, and also between the Amer. colonies and the mother country. These restrictions on foreign trade were not totally withdrawn until the middle of the nineteenth century, and even in the withdrawal the right was retained to retaliate if restrictions were placed on Brit. navigation in foreign waters.

Naville, François Marc Louis (1781-1846), Swiss philosopher, b. at Geneva. He was pastor at Chancy in 1811, and founded there, and later at Vernier, a model school. He followed the philosophy of Maine de Biran. He pub. *De l'éducation publique considérée dans ses rapports avec le développement des facultés la marche progressive de la civilisation, et les besoins de la France* (1832) and *La Charité légale* (1836).

Navy and Navies. The general policing of the high seas has for a long time been assumed to be one of the prin. duties of the Brit. N. To this end the Eng. have in hist. maintained their supremacy of the sea, which in early times was a vital necessity when the is. was open to the invasions of the vikings. The appointment of a 'count of the Saxon shore' was in

really the forerunner of an efficient fleet to protect that shore from foreign invasion. The incursions of the vikings made it necessary to provide some force by means of which the Eng. could repel and in time stop the constant menace of invasion from the E. Practically since the time of Alfred the Great the hist. of the Brit. N. is continuous. Alfred fought the Danes on their own element, and in order to do so made what may be called a levy on each of the sea-border cos. for the provision of a certain number of ships, or a certain amount of money or men for the upkeep of those ships, to defend the coasts of the country from foreign invasion. Between Alfred's time and the Norman Conquest the 'levied' N. was supplemented by the possession by the king of royal ships, and during the years which followed the Norman Conquest the principles of feudalism were applied to the levying of a naval defence. The seaports, held their charters and privileges in return for men and ships which were to serve the king for fifteen days in the year at the expense of the ts. During the twelfth and thirteenth centuries the fleet of the Cinque Ports was practically the national fleet, but this rapidly sank into disrepute, and the R.N. came to be not the feudal array, but the mercenary N. In this respect may be compared the national N. and army, since both have come down not from the feudal array, but from the purely mercenary forces which formed part of the conqueror's supposedly feudal invasion army, and which, especially under the later Plantagenets, displaced the feudal array. The main nucleus of the R.N., however, was the king's own ships, which naturally were much more under his control than those sent him from the cos. These were controlled by royal officials, and were entirely at the command of the king. The crusade of 1190 had one result at least, that of ringing into use in the Eng. N. the title of Admiral, although it was not at first used in the supreme sense in which it is used to-day, and indeed an admiral in that sense was not appointed until 1360, and a First Sea Lord, as the title is known to-day, was not appointed until well into the fifteenth century. Even during the reign of weak Eng. kings the sovereignty of the seas was retained. In John's reign there were victories over Philip Augustus, and in Edward III.'s the victory at Sluys in 1340, and later over the Spaniards at Winchelsea in 1350. Up to this time, at any rate, the Eng. had suffered no great defeat, and their claim to sovereignty in the narrow seas could not easily be disputed, as their retention of Calais for so long a period does much to prove.

During the Hundred Years war the Eng. seldom found difficulty in invading France, and that perhaps was the supreme test. The N. led a somewhat chequered career during the period 1399-1485, but it still remained in existence, and fluctuated in strength according to the strength or weakness of the reigning king. During the Tudor period the N. increased in strength. Henry VII. added to its

numbers, not very greatly, it is true, but nevertheless he laid the foundation for the greater N. which his son was to build. He employed many of the royal ships on merchant ventures also. Henry VIII. took a deep interest in the N. He spent at least some proportion of the plunder of the monasteries in raising an efficient fleet, built according to the latest ideas. As far as the fleet is concerned, the Tudor period was a period of transition, but even during the reign of Elizabeth it never became larger than it was during the reign of Henry VIII. Henry was also responsible for the estab. of a N. Board, under the direction of a Lord High Admiral, and this administrative reform remained in existence down to the time of William IV. The early hist. of the personnel of the fleet shows us that it was regarded very much more as a 'military' force than as anything else. The sailors who navigated the ship were not held of the same importance as the soldiers who defended it. They were also very much in the minority. By the time of Henry VIII. this had to a very great extent changed, nor was this surprising. The era of discoveries had given the ships a very much wider scope than they had previously had. It was necessary now to have a majority of men who were capable of sailing and navigating the vessel. The fighting force, therefore, diminished very largely in numbers. Further the great strides which had been made in the science of navigation rendered it necessary that the men in command should be trained men, and not merely the favoured nominees of the king. It was fortunate that the same modernisation did not take place in Spain, so that the Armada battle was a conflict between the old and the new ideas of ships and sea warfare. Further during the Tudor period the size of the ships increased, and although the number of ships in the N. of Elizabeth was less than in that of Henry VIII., nevertheless the actual tonnage was greater.

The Stuart period is of vast importance for the development of the N. During the reign of James I. many great improvements were made. The position of Lord High Admiral was taken from the hands of Nottingham, perhaps not so much for inefficiency as for corruption, and was put into commission. Although the N. was not maintained at a very great strength, these commissioners nevertheless took steps to see that the fleet was efficient. Further the king himself took great interest in the development of the N., and especially in naval construction. This work was continued during the reign of Charles I., and many reforms were made in the matter of the personnel of the fleet, which was increased, and which received very much better wages. The ships that were constructed were of good quality, and it should be remembered here that Charles's first 'levy of ship money' was in fact employed for the construction and increase of the N. The N. was, however, still small. At the outbreak of war the king had only about forty ships, and these were handed over to Parliament by the

newly created Lord High Admiral. During the period 1642-60 the N. passed into the hands of Parliament, and was controlled by admirals appointed by it. The N. did much good work, and under Cromwell it revived the days when it claimed the sovereignty of the seas. By 1660 the N. had more than trebled in size, and had nearly trebled in tonnage. Further the naval service was no longer regarded as of necessity a service by pressed men; the admirals of the Commonwealth, realising the error of this, opened the service to voluntary servants as well as pressed

over 100,000 tons, a personnel of 42,000 men, and nearly 7000 guns, a vast improvement on the previous reign.

When the revolution came in 1688 the control of the N. passed almost entirely into the hands of Parliament. The title of R.N. was still maintained, and occasionally the form of appointing a Lord High Admiral was gone through, but as a purely royal force the N. ceased to exist. We must remember, however, that it is because the N. was under royal control for so long that it has maintained an unbroken hist., and that it would probably often



'THE GLORIOUS FIRST OF JUNE': LORD HOWE'S VICTORY, 1794

An aquatint after R. Dodd, reproduced by permission of the Parker Gallery, 2 Albemarle Street, London, W.I.

crews. In view of the ever-increasing trade of England, and the necessity to protect the merchant service, the increase of the N. was essential to the well-being of the nation. During the reign of Charles II. the N. did at last become truly national. The work of Samuel Pepys was of vast importance: as clerk of the Acts and later as secretary to the Lord High Admiral he spent his life in a constant and successful endeavour to put the administration of the N. upon a sound, ordered, and disciplined footing, and to provide ships and men for war and peace. The later hist. of the N. is a continuation of the rules which he laid down. Officers received a proper training from the time that they were boys, and special corps were founded in order to have an ever-increasing number of officers prepared for the service. The commerce of the country was much more amply protected, and piracy was put down with a strong hand. Up to the passing of the Test Act (1673) the Lord High Admiral was James, duke of York (afterwards James II.), who, whatever his other faults, proved to be both interested and capable. The N. consisted of about 170 ships of

have fallen into decay had it not been kept together as a royal force. The N. was controlled by the Navy Discipline Act of 1660, which was, at the end of the War of the Austrian Succession, supplemented by an Act of George II.'s reign. In 1793, when war broke out with the Fr. republic, decisive command of the seas was not yet estab., though the N.'s line-of-battle strength numbered ninety-five ships, with a section of which Howe defeated a Fr. fleet off Ushant on 'the Glorious First of June,' 1794.

Few great changes took place in naval construction until the reign of Queen Victoria. Many experiments were made, and the ships increased in size and in the number of guns which they carried; but it was not until the beginning of the nineteenth century that the basic form of wooden ships with sails was changed. The first steam warship was constructed in 1814. After 1834 ships began to be armour-plated, a tribute paid to the ever-increasing power of shells. The year 1860 saw the launching of the first ironclad of Great Britain, but this had been preceded by a vessel of like build launched by

France in the previous year. Guns were, however, quickly invented which could pierce the armour carried by these vessels, and so later ships had a greater thickness of armour, and carried guns which were powerful enough to pierce the armour of the opposing vessels. The ordinary iron-clad was about the year 1862 superseded by the turret ship, and under the direction of Sir E. T. Reed, the constructor of the N., a ship was produced which was capable of firing in all directions from central batteries, and did not depend entirely upon its broadsides. Turret and mastless warships were now regarded as the latest thing in naval construction, and the turrets carried an armour-plating of from 10 to 14 in. thick. The turret ships were in the course of time replaced by ships of the cruiser type. These were armoured and protected, and were speedier than the ordinary line-of-battle ships, but did not carry so much armour-plating and were not so well protected.

After 1880 Great Britain began a definite programme of naval construction calculated on a two-power standard, i.e. up to the equality of the next two strongest powers in the world which, at that time, meant Europe. From this programme developed one more in naval armaments which was a feature leading to the First World War, but it was the other nations who set the pace, because in their building programmes lay the threat to the Brit. Empire. From it evolved the super-dreadnought, ships of 20,000 tons upwards, with a maximum speed of 25 knots, carrying up to eight 16-in. guns, a formidable secondary armament, with armour plating of 14-in. thickness or more. In the First World War the Brit. N. played a dominant part, preserving the country from invasion, keeping open the lines of sea communication, blocking the enemy, and making possible supplies and reinforcements to enable the final decision to be reached on land. As an indication of this vital part played by the Brit. N. Mr. Churchill spoke of Adm. Sir John Jellicoe, its commander afloat, that he was the only man on either side who could lose the war in an afternoon. The casualties sustained by the Brit. N. during this war were 254 warships of all types lost as against 937 total enemy warships destroyed, and 39,766 officers and men of whom over 33,000 were killed, while the N. expanded from 2,419,043 tons in Aug. 1911 to 4,087,950 tons in Oct. 1918.

After the war Great Britain announced that she had adopted a one-power standard in view of the building programmes in Japan and the U.S.A., and proceeded to lay down four new battleships of 48,000 tons each. Such was the state of affairs when President Harding invited nations to the Washington Conference (q.v.), which attained a measure of success by eliminating the factor of competition in naval armaments from the field of international relationship. Limitations imposed on the size of battleships (35,000 tons) now produced novel designs of which the *Nelson* and *Rodney*, of 33,500 tons,

with their main armament of nine 16-in. guns all forward were the most unusual. Meanwhile the possibilities of air power were being appreciated, and it was argued that the day of the capital ship was over, but the building by Germany, limited by the Versailles Treaty (q.v.), of three 10,000-ton pocket battleships of the *Deutschland* class, revived interest in this type of ship. These Ger. ships mounted six 11-in. guns, eight 5·9-in. and five 3·4-in. anti-aircraft, and were designed for a speed of 26 knots. Electric welding was employed in their construction, and internal combustion machinery adopted for propulsive purposes. France replied with the *Dunkerque*, 26,500 tons, 29 knots, eight 13-in. guns, sixteen 5·2-in. guns, which was built during the negotiations for the London Naval Treaty, 1930 (q.v.), held to extend the provisions made at Washington. As a result of this treaty Great Britain, U.S.A., and Japan scaled down capital ship strength, agreed to a six years' building holiday, and put further limitations on cruiser design. France, incensed at Italy's insistence on naval parity with her, refused to approve these limitations, and began to build *contre-torpilleurs* of 12,570 tons, while the It. produced their *cacciatorpediniere* which were small cruisers of over 10 knots speed. Meanwhile Brit. cruiser strength was steadily reduced, while that of all other maritime nations increased. A striking indication of the way in which Great Britain had reduced her naval power compared with that of other countries was given by the First Lord in Nov. 1933, when he stated that, since 1911, the U.S.A. had increased her naval personnel by 39,700 and Japan by 10,000, whereas Great Britain had reduced hers by 55,000. In 1934 Japan gave notice of termination of the Washington Treaty, claimed the right of equality, and, now independent of the League of Nations, began pursuing a virile course of her own in naval construction. In the U.S.A. a programme of new construction up to the limits permitted by the treaty, together with a general modernisation of her ships, was going forward. France was about to launch her first post-war battleship, Germany was asserting her old independence, and any numerical superiority possessed by Great Britain lay in semi-obsolete and obsolete ships. Such were the conditions when Great Britain negotiated a naval treaty with Germany (q.v.) on June 18, 1934, when it was agreed that the latter country could build a surface fleet up to 35 per cent of Brit. naval tonnage, and possess a submarine tonnage of equal strength. She was, however, prepared to adhere to Article IV. of the London Treaty which forbade the torpedoing of merchant ships on sight. Fr. opinion was incensed at this agreement, regarding it as a blow to the unity announced at Stresa (q.v.), and it hardened her determination to have nothing to do with Washington ratifications. Within a few months Mussolini awoke Great Britain from her dream of disarmament by his campaign in Abyssinia, which brought a concentration of Brit. naval strength in Alexandria. The

answer to the question whether sea power was still effective before the air might of another nation seemed imminent. But hostilities were avoided, though events demonstrated the necessity for Britain to uphold her old position at sea.

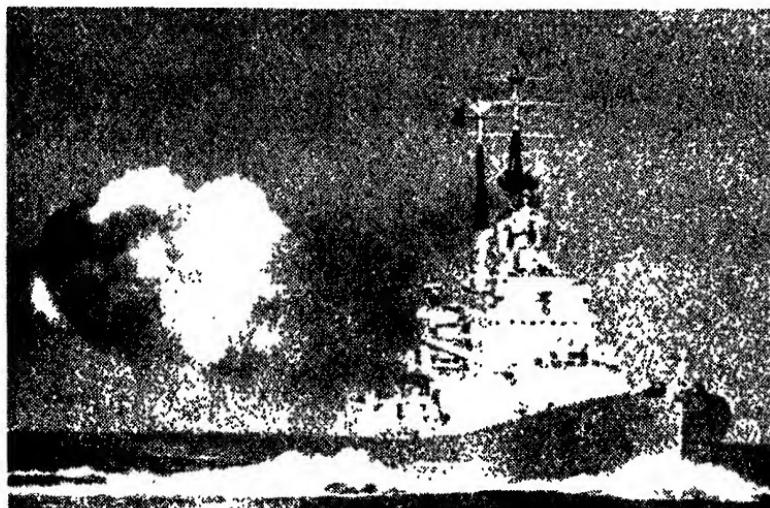
During this crisis the second London Naval Conference opened in Dec. 1935 (see LONDON NAVAL TREATY, 1936), as the powers had agreed to meet within a year of the termination of the Washington Treaty by one of them. Japan withdrew, while France and Italy were unable to associate themselves with the agreement reached between Great Britain, the dominions, and the U.S.A. This limited capital ship armament to 14-in. guns, reduced the size of aircraft carriers, and imposed still further limits on cruiser construction. But the growth of international tension soon made the treaty abortive, and advantage was taken of the 'escape' clauses to meet the war which threatened. Could the N. still defend the vital interests of the empire in view of the new air menace? Had it the right type of ships? Were they properly armed? Were its functions adequately co-ordinated with those of the other Services? And had the development of asdies reduced the threat from submarines which had nearly brought defeat in the First World War? All these questions were now to be answered, and lessons were to be learnt at great cost. It was soon apparent that, although a warship well manœuvred was a more difficult target for an aircraft to hit with a bomb than had been expected, the ships themselves were woefully deficient in anti-aircraft guns. In many destroyers the torpedo tubes were removed, and combined low high angle guns substituted as they became available; cruisers, such as the *Dido* class, were solely armed with these dual purpose guns, which also formed the secondary armament of the new battleships of the *King George V.* class (see further KING GEORGE V.), and gradually numerous light, close-range anti-aircraft guns were mounted on their decks. Thus a few warships in company could eventually put up a heavy anti-aircraft barrage that both deterred and destroyed enemy aircraft. It was nevertheless clear that no warship, however arm'd, could operate with impunity within range of shore-based aircraft without the protection of some sort of air umbrella, and that insufficient attention had been paid to sea air co-operation. In 1939 the Fleet Air Arm had been regarded as little more than a long-range telescope for the fleet, useful perhaps to hinder an escaping fleet, and it had been accepted that carrier-borne aircraft must inevitably be slower and less powerful than its hand-based equivalent.

This heresy took a long time to die, but from operations off Norway, in the Atlantic against the *Bismarck*, in the Mediterranean and in the Pacific (see NAVAL OPERATIONS IN SECOND WORLD WAR), emerged the modern conception of what is now known as the Naval Air Arm, with its fleet, fighter, and reconnaissance carriers (see AIRCRAFT CARRIERS). The

war indeed proved that naval aircraft could even win a sea battle before the guns on either side had fired a shot (see NAVAL OPERATIONS IN SECOND WORLD WAR, Battle of Midway Island). The elements of the air arm are now integrated with the fleet and, known as naval aviation, comprise between one-quarter and one-third of the total strength of the N., and incorporate such modern aircraft as the Vickers Supermarine Attacker, the Sea Vampire Jet fighter, Sea Hornet, Firefly, Sea Fury, and the Hellicopter, each with its allotted task. The aircraft carrier has thus superseded the battleship as the most important fleet unit, although battleships in the Second World War, when operated properly, justified their existence and confounded the inter-war critics who prophesied their doom (see BATTLESHIPS). Protecting convoys against powerful surface raiders, hurling hundreds of tons of high explosive into enemy positions ashore in N. Africa, Italy, and Normandy, and in protecting carriers themselves from both surface and air attack, they fulfilled their purpose in modern warfare. There were also occasions when weather conditions prevented the operation of aircraft, such as when a Brit. battleship, the *Duke of York*, destroyed the powerful Ger. battleship *Scharnhorst*, which menaced the convoys to Russia. Against submarines the early confidence in asdies was at first misplaced. The apparatus could certainly detect submerged U-boats in general conditions, but it was not designed to seek out the enemy on the surface at night. Thus U-boats were often enabled to approach on the surface without detection and attack convoys in darkness, causing heavy losses. These attacks could only be overcome by more escort vessels and, in due course, the corvette and frigate were developed. Not differing greatly from sloops, they possessed advantages in respect of handiness, economy of personnel, and, most important of all, they could be built quickly and in numbers. They carried depth charges and H.A./L.A. guns. But it was not until the development of radar that the measure of the submarine menace could be taken, when they were once more subject to detection, whether on the surface or submerged. In countering the U-boat, the N. developed a close association with Coastal Command (q.v.) of the R.A.F., while escort carriers sailed with nearly every convoy. These were merchantmen converted by the U.S.A. under lend-lease and returned at the end of the war. Towards the end of the war Germany had developed a device where, by fitting U-boats with a *Schnorkel* (or breathing device), they need never surface, and could thus escape both aircraft and the radar screen. Fortunately the war ended before this invention could influence the battle of the Atlantic to any great extent. In spite of the great battle against U-boats, however, and the development in the mine and torpedo, it is a fact that these weapons did not influence the tactics of warships to the same extent as they did in the First World War.

In general it can be said that the Ns. of Great Britain and the U.S.A. achieved their strategic objectives (see STRATEGY). They maintained the flow of shipping across the oceans, without which the strongest armies and air forces would have been powerless to act; they denied to the enemy his ability to use the sea, and imposed an effective blockade on his coasts; they successfully transported powerful armies across thousands of miles of ocean with barely a loss, making possible the

the Brit. N. expanded from 123 effective fighting vessels of all kinds in 1939 to 2040 in 1945, without including hundreds of landing craft and motor launches; and its personnel increased from 133,000 to 864,000. On the conclusion of war these figures rapidly decreased, warships were scrapped, sold, or transferred to dominion Ns., others placed in reserve, 4500 merchant craft employed on naval service were dispersed, over 1200 fishing vessels released, and by April 1950 the personnel



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H.M.S. "VANGUARD"

The battleship is seen firing her main armament of 15-in. guns during target practice off Malta.

campaigns in Africa and Europe; they guarded the flow of oil to feed the growing air forces; and, with the N. of the U.S.A. as the major partner in the area, carried the war across the Pacific to the threshold of Japan. Meeting the threat from the air they challenged it by absorbing and making the air their ally, changing their tactics without fundamentally altering their strategy. But at a cost. The losses to the Brit. N. (including dominion navies and Royal Marines) were more than two-thirds greater than they were during the First World War; over 73,000 officers and men lost their lives. 1500 Brit. warships of all kinds were lost and, although over 2000 merchant ships were sunk in the N. Atlantic alone, this figure represented less than 2 per cent of the numbers convoyed. On the other hand, the axis powers lost 996 submarines (Ger. 781) against the Brit. losses of 76, and almost 1700 other war vessels (including 627 in the Pacific destroyed mainly by the U.S.A.). Meanwhile, in spite of its losses,

reduced to 146,000. This rapid reduction in personnel caused such a lack of balance from the loss of experienced men that in 1947-1948 it was necessary to immobilise the greater part of the fleet. But the build-up to peacetime strength proceeded slowly, and the Brit. fleet, including those vessels in reserve, stood in 1949 at 5 battleships (reserve), 6 fleet carriers (3 in reserve), 6 light fleet carriers, 29 cruisers (12 in reserve), 118 destroyers (65 in reserve), 173 frigates (129 in reserve), 65 submarines (31 in reserve), and 66 minesweepers (50 in reserve). Ten carriers, including 2 fleet, were under construction in 1949, as well as a few cruisers and destroyers, but no new construction on capital ships was then contemplated until a decision on their future had been reached. Of these battleships on the stocks at the end of the war only the *Vanguard* (12,500 tons) was completed in 1946. She carries eight 15-in. guns, sixteen 5·2-in. H.A./L.A., seventy 40 mm. A.A., and has a speed of 28 knots.

Since the Second World War the Brit. N. has resumed its peacetime functions of showing the flag as well as carrying out duties in connection with the occupation of ex-enemy countries. It has quelled disturbances in Aden, Mogadiscio, and the Solomons, and restored stability in many another troubled area; it has played an active part in coastal operations against Communist bandits in Malaya; brought succour to distressed areas; swept the sea of thousands of mines laid during the war; continued to chart inadequately surveyed coasts, and carried out investigations in the polar regions. (For the *Amethyst* incident see under YUNGERZEN-KIANG.) But its prin. function has not been neglected, the preservation of sea communications in time of war. Changed conditions produced by the growth of air power, the atom bomb, the development of high-speed submerged submarines, the extension of radar, have in no way altered this conception of the N.'s function, though they have demanded a different and more scientific approach to it. This has been recognised in the growth of the Royal Naval Scientific Service (q.v.), and the encouragement given to research. In constantly exercising to test new tactics the Brit. N. has not worked alone, but in co-operation with other nations of W. Union and the N. Atlantic Treaty. For the first time in hist., during a period of peace, an international fleet assembled in Brit. waters in the summer of 1949, when warships of countries belonging to W. Union carried out combined manoeuvres and exercises under the command of a Brit. commander-in-chief. Recognising the vital importance of inter-service co-operation, much attention is also paid to the training of officers and men in the technique of combined operations, and in the joint naval air anti-submarine school the problems of anti-submarine warfare are being investigated on a two-service basis. To-day, owing to the technical developments, and the growth of naval aviation, a greater part of the N. is quartered ashore than ever before. Conditions have improved. Married quarters for naval personnel serving abroad in shore estabs. have, for the first time, been provided; more attention has been paid in ships themselves to better messing accommodation and ventilation; a new pay code was introduced on July 1, 1946, and more opportunities given to those in humble circumstances, who prove themselves worthy, to rise in the service (see NAVAL EDUCATION; RANK). The total figure of 146,000 for the peacetime N. is to include 14,000 Royal Marines (q.v.) who, in addition to their traditional functions, now provide and train the permanent peacetime amphibious commando units; 1400 Royal Marine Police for the dockyards and 7200 W.R.N.S. (q.v.) are also included in this figure, but the reserves (see NAVAL RESERVES) could probably provide another 100,000 at short notice in an emergency.

On the future of Ns. there is considerable speculation. They have grown up in the past in a world composed of sovereign states, many of which had a common

standard of material strength. But the Second World War left the world with only three great powers that counted, the Brit. Empire, the U.S.A., and the U.S.S.R. The first two powers have so many ideals in common that war between them is unthinkable, and the Brit. Empire naturally makes no attempt to compete with her transatlantic partner in naval competition. Indeed, in the event of hostilities, the two fleets would probably be integrated under the N. Atlantic Treaty. Russia is essentially a land power, but now developing her N., especially submarines. It is argued that the atom bomb has destroyed the effectiveness of fleets, but, on the other hand, it has been pointed out that this weapon is unlikely to be used against ships at sea where, by spacing them at greater distances apart, the damage can be so reduced as to make its employment uneconomical. The atom bomb has, however, modified the methods of sea warfare without altering its conception. Large fleets concentrated in harbours, as they were in the First World War, face annihilation, but, by dispersing ships in many different bases when in harbour this menace can be minimised. It can also be countered by the development of the 'fleet train,' composed of auxiliaries of all kinds, used in the Pacific to supply and maintain ships at sea for periods of months if necessary. It may be that command of the sea as previously understood will, in future, only be confined to specified strategic areas. But the fact remains that, apart from internal disruption, only the denial to the Brit. Empire of its ability to move its ships across the sea can cause its defeat in war. It is appreciated, however, that air power has robbed the N. of its ability to shelter the United Kingdom against attack, and allow the country time, in the event of war, to gather its strength in comparative tranquillity. It may also be that the design and material of warships will be modified. Aircraft carriers will remain, as they are to-day, the most important units in a fleet. But they cannot always defend themselves against naval attack, and aircraft are still subject to immobilisation through heavy weather. They will need cruisers and destroyers, probably faster and armed with rockets as opposed to guns, to protect them. Submarines will always be required (and methods to counter them), and it is possible that need will still be felt for some form of capital ship, in reduced numbers, to provide heavy armament or launching sites for possible rockets. Finally the only effective answer to the atom bomb, or any other form of attack, is by the direct human control of the enemy stronghold, which must require the use of all arms in unison and collaboration. This process must involve the movement by sea of large armies and their equipment, perhaps half-way across the world. So long as such transport, involving command of the sea, is indispensable to the operation of armies, Ns. can never be obsolete. See also SEA POWER, and the section Defence in articles on countries.

*See A. T. Mahan, *Influence of Sea Power upon History, 1660-1783*, 1890; Adm. Sir W. M. James, *The British Navy in the Second World War*, 1946; G. Holman, *The King's Cruisers*, 1947; A. Bryant, *Pepys* (3 vols.), 1947-49; M. Lewis, *The Navy of Britain*, 1948; and *Jane's Fighting Ships*, pub. annually.*

Navy Board, The, board estab. in the reign of Henry VIII. to superintend the administrative work of the navy. It remained in existence between the years 1546 and 1832, when it was abolished and its work taken over by the lords of the Admiralty.

Navy Department of the U.S.A., gov. dept. of the U.S.A. Naval affairs are administered by an advisory council under a chief of operations, who is directly responsible for fleet operations and readiness during war emergencies. Other personnel of the naval staff includes an assistant secretary, the chief of the bureau of navigation—in whose control are the officers and non-commissioned ranks—and the chiefs of construction and repair; engineering; aeronautics; supplies and accounts; yards and docks; ordnance; and medicine and surgery. There is also a commandant of the marine corps and a judge-advocate general. Questions of policy are discussed by the Naval General Board, composed of senior officers under the chief of operations. The President of the U.S.A. is the commander-in-chief.

Navy League, The, organisation founded in 1895 for the purpose of advocating the building of an adequate navy for the protection of Great Britain and the maintenance of sea-power. It is on the strictest of non-party lines, and aims at the educating of Parliament and the people on the lines laid down in its programme. It propagates information concerning the navy, past and present, by means of monthly, quarterly, and annual publications, by lectures, and by the pub. of many pamphlets.

Navy, U.S.A., see NAVY DEPARTMENT OF THE U.S.A.; UNITED STATES, *Army and Navy*.

Navy Yards, see DOCKYARDS, GOVERNMENT.

Nawanagar, or Jamnagar, seaport tn., cap. of N. dist., on the gulf of Cutch, India, and also the name of a state in India of 3790 sq. m. (pop. 504,000), in Saurashtra Union. The chief manufus. are silk and embroidery. Pop. 71,588.

Naxos: 1. Is. of Greece in the Egean Sea, the largest of the Cyclades (q.v.), has an area of 175 sq. m. It is mountainous and fertile, and produces quantities of wine, for which reason it was chosen as the centre of the worship of Bacchus. It was colonised by the Athenians, conquered by Persia in 540 B.C., and recovered its independence in 471 B.C. In the thirteenth century it became part of a Venetian duchy, was taken by the Turks in 1566, and now belongs to Greece. The other products are cotton, grain, and fruits; there are granite and marble quarries. Emery is found in abundance in the S. of the Is. Pop. 15,000. 2. Cap. of the

above is., is a port on the N.W. coast and the seat of a Gk. and of a Lat. bishopric. Pop. 2100. 3. Name of the first Gk. colony in Sicily, founded 735 B.C., and destroyed by Dionysius of Syracuse in 403 B.C.

Nayant, state of Mexico, cap. Tepic, stretching along the Pacific coast, with Sinaloa to the N., Durango to the N.W., and Jalisco to the W. and S. Tobacco is grown. Area 10,444 sq. m. Pop. 216,600.

Naylor, James (c. 1617-60), Eng. Quaker, b. at Ardsley in Yorkshire. He joined the parl. army in 1642 and was present at the battle of Dunbar, 1650. In 1651 he became a Quaker, and gathering round him a party of followers travelled from place to place. He was imprisoned in 1653 at Appleby, and again in 1656 at Exeter, and on his release from Exeter jail made a triumphant procession into Bristol, giving out that he was Christ. He was arrested at the High Cross and brought to trial, and on being convicted of blasphemy was sentenced to be whipped, branded, and imprisoned.

Nazarenes, name applied by Tertullus (Acts xxiv. 5) to the early Christians, but later applied to a Jewish Christian sect, better known as Ebionites (q.v.).

Nazareth: 1. (Modern al-Nasira) tn., of Galilee, Palestine, situated about midway between the Mediterranean and the S. end of the lake of Galilee. It is important only for its connection with the life of Jesus Christ, where His early years were passed in the house of Joseph and Mary. No mention of N. occurs in the O.T. and in the time of Christ it was so insignificant that the term Nazarene was applied to him in derision. To the reign of Constantine N. was inhabited by Samaritans; it declined rapidly after the Arab conquest, revived during the Crusades, and again in the seventeenth century when the Franciscans estab. a church on the supposed site of the House of the Virgin. It is now a tn. of 15,500 inhab. and around its hills are orphanages and hospitals. The Franciscans have reconstructed the churches of the Annunciation and of St. Joseph. The church of the Melkites is claimed to be the synagogue where Christ preached (Luke iv. 16). The general aspect of N., with its hilly background, orchards, cypresses, and churches is that of some Tuscan hill tn. See L. and R. Ronch, *Palestine Handbook*. (See illustration, p. 598.)

2. Tn. of Bahia, Brazil, on the l. b. of the Jaguaripe. Pop. 8000. 3. Tn. in Brazil in the state, and 35 m. N.W. of the tn. of Pernambuco. Pop. 15,000.

Nazareth Islands, see CARGAOS.

Naze, The: 1. Cape on the E. coast of Essex, England, 5 m. S. of Harwich. 2. Or Lindeenas, a cape of the extreme S. of Norway, near the entrance to the Skagerak (Skager Rack).

Nazianzen, see GREGORY NAZIANZEN.

Nazim Bey (d. 1926), Turkish agitator and leader of the Young Turks. A medical doctor by profession, he early abandoned this career to take up the cause of the Young Turks. This he did by going about disguised as a dervish among the

Turkish garrisons and suborning the soldiers. After the grant to Turkey by Abdul Hamid of a constitution, N. was made a member of the executive gov. and of the Committee of Union and Progress, but at once made use of his position to intrigue for his own ends. He made great efforts to exclude all other than Turkish education from the Macedonian schools, and to force the Arabic written language on Albania. In the First World War he led the Turkish Red Crescent on the Macedonian front, but was subsequently

the Lord and separated from the rest of the people. The Nazirite vow demanded: (1) Abstinence from intoxicating liquor and from all the produce of the vine; (2) that the hair should not be cut at all but suffered to grow to its full length; (3) avoidance of all ceremonial defilement, such as that involved by contact with a corpse. If the Nazirite vow were taken only for a period of time, its expiration was marked by a ceremonial sacrifice. Other N. (e.g. Samson, Samuel, and the Rechabites) were vowed for life.



NAZARETH

Canadian Pict.

arrested by the Gks. for conniving at the escape of prisoners of war. A zealot for the Altai or Turanian tongue, he organised massacres of Armenians, in 1926, in the hope of finally destroying their culture, but was hanged in the same year at Ankara for plotting against the life of Mustapha Kemal Ataturk.

Nazimuddin, Khwaja (*b.* 1891), second governor-general of Pakistan. A member of a prominent Dacca family, he was educated at Cambridge Univ., and called to the Bar. He was an influential collaborator with Dr. Jinnah (*q.v.*) in the Muslim League, where he was successively minister of education (1929-31), home minister (1937-41), chief minister (1943-45), and, after the estab. of Pakistan, Premier of E. Bengal. He was knighted by the Brit. Gov. in 1934, but, in common with other prominent Muslim League members, he renounced the title in 1946. He succeeded Dr. Jinnah on the latter's death, as the second governor-general of Pakistan, being sworn in on Sept. 14, 1948. After taking office he announced that the national memorials to the late *Quaid-i-Azam* (Dr. Jinnah) would take the form of a mausoleum, a mosque, a univ., and a national institute of technology.

Nazir, see NAZARETH.

Nazirites, or Nazarites, among the anc. Israelites those specially consecrated to

Nazis, popular contraction for the Ger. National Socialists (*see NATIONAL SOCIALISM*). The word seems to have originated as a parallel to 'Sozi,' the label given to the Ger. Socialists by their opponents. National Socialists were at first styled 'Nazi-Sozi,' but the second half of the style was omitted later. The N., under the inspiration of Hitler, represented the revival of the *Nationalist* of the fatherland, the regeneration of the national and social life of Germany, and the rekindling of Ger. patriotism after a decade and a half of weak govs., which were sometimes strongly influenced by Communism. During this period unemployment was rife; there was corruption in public life, and the people as a whole suffered from an inferiority complex. Hitler succeeded in rallying the nation against the Communists and, in the elections, completely overwhelmed their leader Thaelmann. The incident of the Reichstag fire, too, enabled him to stage a dramatic trial of the alleged Communist incendiaries and thereby emphasised his ascendancy over them. Under Hitler the N. then carried out the 'Hitler revolution,' in which they assumed control of most of the police in Germany, banned the Social Democratic press, persecuted the Jews, issued emergency decrees for 'high treason,' instituted a Ministry of

Propaganda under Goebbels (q.v.), replaced Braun as Prussian Prime Minister by Goering (q.v.), dissolved the Catholic party, confiscated the funds of their chief political opponents, and disbanded the trade unions. After the official declaration that the revolution was accomplished a reign of terrorism ensued in which the N. mercilessly assailed all schools of thought opposed to their social and political outlook, driving thousands of persons into concentration camps. But the most characteristic feature of the Nazi persecution was Hitler's unrelenting persecution of the Jews (see under 'MEIN KAMPF') which began in 1933 and continued during the Second World War. The swastika or crooked cross, the symbol of the N., is related to Hitler's theory of Aryanism (q.v.); but the Nazi claim that the swastika was an ancient Teutonic or Nordic device is ill founded, for it is virtually a symbol of the sun and occurs in the reliefs of many earlier civilisations. The uniformed bodies of the N. played an important part in their success in gaining control of the reliefs of power. They include Storm Troops (*Sturmabteilungen*), Security Corps (*Schutzstaffel*), and Hitler Youth (*Hilfslaufe*). See also GERMANY; HISTORY; HITLER; ADOLF; S.S. and S.A.

Neagh, Lough, ^{lough} Ulster, N. Ireland, largest in the Brit. Isles (17 by 10 m.). It receives the Blackwater and Ballinderry Rrs. and is drained N. to the Atlantic through the Bann R. The shores are mostly flat and marshy, and its waters have a petrifying quality. There are canals to Belfast, Newry, Tyrone, and Lough Erne. The lake abounds in fish. There are a few is. in the lake. Area 153 sq. m.; average depth 10 ft. See Moore's ballad, *Let Erin Remember*.

Neale, John Mason (1818-66). Eng. divine and hymn writer, *b.* in London. He belonged to the extreme High Church party, and in 1851 established the sisterhood of St. Margaret, afterwards transferred to E. Grinstead. He wrote or trans. nearly one-eighth of *Hymns Ancient and Modern*, and pub. *A History of the Hymns and Sequences of the Jews* (1841); *A History of the Holy Eastern Church* (1817-73); and *Medieval Hymns and Sequences* (1851, 1863). See J. Julian, *Dictionary of Hymnology*, 1907, and memoir by E. A. Towle (with list of writings), 1907.

Neanderthal, Johann August Wilhelm (1789-1850). Ger. theologian and historian, *b.* at Gottingen. In 1812 he became prof. at Heidelberg and the following year at Berlin, where he devoted himself to the advancement of Christianity. He lectured on Church hist., ethics, and systematic theology, and was the founder of modern Church hist. His prin. work is the *General History of the Christian Religion and Church* (1852), trans. by J. Torrey, and widely circulated in England and the U.S.A. Among his other publs. may be mentioned *The Life of Jesus Christ in its Historical Relations* (1848); *The Emperor Julian and his Times* (1850); and *Memorable Occurrences from the History of Christianity and Christian Life* (1852); etc. See life by A. Wiegand, 1890.

Neanderthal, valley of the Rhine Prov., Germany, in the dist. of Dusseldorf, near the vil. of Mettmann. Here in 1856 was found the skeleton of a prehistoric man whose cranium has formed the subject of much discussion among anthropologists on account of its peculiar formation. Other skulls, bearing similar characteristics, have been found in the caves and quaternary strata in France, Belgium, Bohemia, Italy, Moravia, and Gibraltar, and in Asia Minor, the Malayan Archipelago, and S. Africa. The skull had a low forehead, was large and thick, with large protuberances of the occipital region. It is believed to have belonged to a troglodyte or primitive cave-dweller, and representative of the earliest dolichocephalic or long-headed race in Europe. Some authorities deny that the skull has any simian racial indications, but that the abnormalities were caused by disease during lifetime.

The N. man is generally thought to be unrelated to modern or Aurignacian man (see MOUSTERIAN). The discovery in 1923 at Ehringsdorf, near Weimar, of a skull embedded in a travertine quarry seems to indicate that the men who lived in Germany in the preceding temperate period before the last or Wurm glaciation set in must be assigned to the N. type in structural details. The Ehringsdorf man has generally been assigned to the Acheulean culture, but his tools are more akin in type to those of the Mousterian culture. Prof. Wedenreich found that there was clear evidence of many wounds inflicted either before or after death and arrives at the gruesome conclusion that the skull had been cast away by a party which had feasted on the brain. There seems no doubt that the skull and other fossil remains found at Ehringsdorf are representative of the people who lived in Germany in the protracted period which preceded the last glaciation. Sir Arthur Keith emphasises that N. skulls are usually low-roofed, but that the Ehringsdorf skull has a lofty vault, its height being due not to the thickness of the cranial vault, but to its massive size. He points out that as a rule we may regard skulls with thick bony walls and restricted brain space as being primitive in character, and those with thin walls and expanded brain chambers as highly evolved. Yet when we apply this test to the Ehringsdorf skull we find that it is less primitive than are most N. skulls, and yet it is the oldest representative of the N. type known to us so far. It is not only the size but also the characters of the brain of the Ehringsdorf man which impress us. It was apparently not lack of brains which caused N. man to perish in Europe. Weighed by geological, palaeontological, and archaeological evidence, we must conclude that in point of antiquity there is probably no great difference between the age of Australopithecus and of Ehringsdorf man, both having been found in comparable sites. In following N. man across Europe, from Spain to Italy and S. Russia, all the evidence points to the extinction of the type before the climax of the last ice age, for no

evidence of the N. man's persistence after the earlier phase of this glaciation has been found anywhere. While the skull found at Ehringsdorf represents an early phase of Mousterian man the skulls found in Gibraltar and La Quina represent a late phase. If Ehringsdorf produced one of the latest finds in Europe, Gibraltar yielded the first N. skull—the skull of a woman known as Gibraltar I., found in a quarry at the base of the N. face of the Rock in 1848—though its true significance was not appreciated until the published description of Prof. Solias in 1908. The parts of a second Gibraltar (Gibraltar II.) skull were found in 1926 after an organised search in a rock-shelter, the possibility of such a find being suggested in 1919 by the Abbé Breuil, whose coadjutor, Miss Dorothy Garrod, carried out the necessary excavation work. This was the skull of a child in several parts, casts of which were made by Prof. Arthur Thomson of Oxford Univ., and presented to the museum of the Royal College of Surgeons. According to Sir Arthur Keith N. children must have assumed the appearance of maturity at an earlier age than modern children. He estimates the age of the child to have been about five at death, and that for this age it had a head and brain of truly remarkable size, and a larger jaw than the modern child of comparable age. The N. type has been found near Talgha, in Palestine (1925), or, at all events, a variant of the extinct N. type, and there is presumptive evidence that once the shores of the Mediterranean were inhabited by people of the N. or Gibraltar type. The man of La Chapelle-aux-Saints, also a modern discovery, is the largest-brained member of the N. species known to us. The cranial capacity of this skull measured 1625 c.c., nearly 150 c.c. more than in the average European man of to-day. But if their capacity was great the N. skulls are mostly low-roofed and their tendency is to compensate in width what they lack in height. Two N. skulls found at La Quina in the dept. of Charente lay in deposits assigned to the upper or later Mousterian culture. As in the case of Gibraltar, one skull is attributed to a woman while the other is thought to be that of a child; but in the shape of head—particularly in the length and narrowness of the skull—the two pairs of skulls differed greatly. Modern anthropologists conclude that these skulls of children from Gibraltar and La Quina suggest that in the regions of the forehead and occiput the N. and neanthropic types differed much less in early childhood than in adult years; but the essential characteristics of the N. race show that the differences between the N. and neanthropic species of mankind are deep, real, and probably of very ancient date. Up to now anthropologists have not traced the dolicocephalic N. man by his fossil remains into the W. of Europe beyond the Channel Is., and, although his work-floors have been found in England, no skull or bone has yet been discovered there (see Sir Arthur Keith, *The Antiquity of Man*, 1915, and especially his *New Discoveries relating to the Antiquity of Man*, 1931). In 1938

Prof. Okladnikov discovered in a grotto in the Hissar mts. in Uzbekistan the skeleton of a child of Neanderthaloid type, the only relic of the kind yet found in central Asia. See ANTHROPOLOGY and MAN.

Neanthropic Man, name given by anthropologists to the proto-Europeans or forerunners of modern Europeans, who colonised Europe after the disappearance of the Neanderthal man. Their origin and lineage are very conjectural, and the fact that the differences between them and their Neanderthaloid predecessors are very marked enhances the difficulties on the problem (see NEANDERTHAL). On the other hand, some suggest that there was no absolute break between the Neanderthal and Neanthropic periods of culture and that the Neanderthal man underwent evolutionary changes which transformed him into modern man. The main problem is to account for the divergence of N. M. into races and for the geographic distribution of these races in past times. Sir Arthur Keith suggests that men of the Neanthropic type of the later palaeolithic period came from the S.W. of Asia, where later the early pioneers of civilisation also made their appearance. It seems to be conceded that an early pleistocene ancestor of the modern type of N. M. came to light with the discovery of Sinanthropus (the Peking man). For a statement of the present state of knowledge concerning these important critical changes in the hist. of Europe see Sir Arthur Keith, *New Discoveries Relating to the Antiquity of Man*, 1931, chapters xxiv–xxvi.

Neapolis: 1. Anct. seaport of Philippopolis in Macedonia, the modern Kavalla (pop. about 5000) being near the site. The tn. was almost opposite Thasos Is. St. Paul landed here (see Acts xvi, 9–11). 2. Anct. name for Naples (q.v.) in Campania, Italy.

Neap Tides, see TIDES.

Nearchus, commander of the fleet of Alexander the Great in his Indian expedition, 327–326 B.C. He received command of the fleet ordered by Alexander to be built on the Hydaspes, and conducted it from the mouth of the Indus to the Persian Gulf, the whole journey taking from Sept. 325 to Feb. 324. Fragments of his own narrative of his voyage have been preserved in the *Indica* of Arrian.

Nearectic, see under GEOGRAPHICAL DISTRIBUTION.

Neath, municipal bor. and rly. port of the co. of Glamorganshire, S. Wales, on a navigable rly. of the same name, 7 m. N.E. of Swansea. It contains the remains of an anct. castle, and in the vicinity are the ruins of Neath Abbey. There are at Neath anct. copper, tin, and steel works. Until recently there has been only inference to connect Neath with the thirteenth-century Rom station of Nidum mentioned in the Antonine Itinerary; and the proved Rom. road system left Neath to the S. But fragments of Samian pottery (assignable to A.D. 70–80, the period of the Rom. conquest of S. Wales), unearthed in Aug.

1949 near the site of Neath Abbey, together with traces of stone walls and broken Rom. floor tiles, afford evidence of an early military occupation of Neath and of the estab. there of an auxiliary fort. Pop. 33,300.

Nebo, **Nabu**, or **Nabium** ('the proclaimer'), one of the chief deities of Babylonia and Assyria, originally worshipped at Borsippa in his temple, E-Zida.

Nebraska, one of the N.W. central states of the Amer. Union known as the 'tree-planter's state,' bounded on the N. by S. Dakota and Iowa, on the E. by the R. Missouri, separating it from Iowa, on the S. by Kansas and Colorado, and on the W. by Wyoming and Colorado. Area 77,237 sq. m. There is much prairie land, a strip of 'bad lands' and sandhills (N. and N.W.), and high land in the W. towards the Rockies, Niobrara Summit, and Gabe Rock rising over 5000 ft. The Platte, Missouri, Republican, and Niobrara are the chief rive.; Omaha (223,800) and Lincoln (cap., 81,900) are the chief tns. Omaha has an air-mail aerodrome. Agriculture is the leading industry, oats, maize, and wheat being the chief cereals. Irrigation is practised in the W. The livestock industry is only second in importance to agriculture. The chief mineral products are limestone, sand, potash, and clays from which bricks and tiles are made. Slaughtering and meat-packing, centred at Omaha, are important industries, also dairying and flour milling. Omaha is also the largest butter-producing tn. in the world. There is a state univ., founded at Lincoln, 1871. What is now known as Nebraska was ceded by France to Spain in 1762, returned to France in 1801, and purchased by U.S.A. in 1803 as part of the Louisiana purchase. Nebraska ter. was organised in 1854; the state was admitted to the Union in 1867. There are ninety-three cos. Since 1937 Nebraska has had a single-chambered legislature of forty-three members. Two senators and four representatives attend Congress. Pop. 1,315,800. See J. S. Morton, *History of Nebraska*, 1913; A. E. Sheldon, *Nebraska Old and New: History, Stories, Folklore*, 1937; and G. E. Condra, *Geography, Agriculture, and Industries of Nebraska*, 1932.

Nebraska City, co. seat of Otoe co., Nebraska, U.S.A., on the Missouri, 40 m. S. of Omaha. Pop. 7300.

Nebuchadnezzar, or **Nebuchadrezzar**, king of the Neo-Babylonian Empire, from 604 B.C. to 561 B.C., the son of Nabopolassar, during whose reign N. defeated Necho at Carchemish. At the beginning of his reign N. had to subdue Jehoiakim, who had rebelled against him. Jehoiakim was succeeded by his son, Jeconiah, and N. now besieged and took Jerusalem and took Jeconiah captive to Babylon. After an unsuccessful attempt on Tyre, N. again laid siege to Jerusalem, which submitted after two years. Not long after this he invaded and conquered Egypt. N. rebuilt Babylon, Koldeway's excavations of 1890 to 1911 revealing the palace, temples, walls, etc. In his latter years he was afflicted with madness and had to be put under restraint. He reigned

forty-three years, and with him departed the glory of Babylon.

Nebulae. The invention of the telescope made possible the recognition of many stars invisible to the naked eye. Nevertheless if the sun is excepted, the stars are at such enormous distances from the earth that they appear as mere points of light even when viewed by the most powerful of modern telescopes. In the eighteenth century, however, the telescopes of Herschel and others led to the discovery of celestial objects that presented a cloudy appearance, and they were designated N. During the twentieth century much has been discovered about N., which here can only be summarised. N. are divided into two main classes: those within our *galactic system* (q.v.) and those outside the galaxy, known as the *extra-galactic N.* In the galactic system two types of N. are found, known as the *planetary N.* and the *diffuse N.* The former have relatively small angular dimensions and are wisps of gas enveloping very hot stars which render them luminous. Most of them have disks which are elliptical shaped, hence their designation as 'planetary N.' It is believed that they were once novae (q.v.) which they resemble in some ways. Two well-known examples of this type are the Owl Nebula in Ursa Major and the beautiful Ring Nebula in Lyra. Diffuse N. are irregular in shape and have larger dimensions than the planetary N. They consist of gases in an extremely attenuated form, some of them presenting the appearance of dense clouds, while others appear as a faint haze. One of the finest of them, in the constellation of Orion, is visible on a clear night to the naked eye, surrounding the middle star of the Giant's sword. To the modern astronomer and philosopher the extra-galactic N. are the most important, because they are island universes on the same footing as our galaxy, of which the solar system is only a very minute part. The Great Nebula in Andromeda is one of this class and can be seen with the naked eye; the light from it takes nearly 900,000 years to travel to the earth, yet it is one of the nearest of the extra-galactic N. The number of stars in these N. varies but is comparable with the number in our galaxy, i.e. about 100,000,000,000. The largest telescope to-day (the 200 in. at Mt. Palomar) will probably be able to photograph N. 1,000,000,000 light years distant and the number contained in this space is estimated to be several hundred million. It is impossible to see individual stars in these very far off N., which appear as a faint luminosity due to the combined light of the stars composing them. See NEBULAR HYPOTHESIS.

Nebular Hypothesis, attempt to explain the origin of the solar system as an evolution from a nebula. Swedenborg and Kant both put forward tentative explanations of this kind, but Laplace (q.v.) was the first to develop a N. H. on strictly scientific lines. Briefly his hypothesis imagined that rotating nebulae were first formed by the condensation of gaseous

matter, and that the sun was originally a nebula of this type. As the nebula continued to shrink, it rotated faster and faster, until fragments broke away from the main body of the sun. These fragments condensed under their own gravitational attraction, and became the planets that continued to describe orbits round the sun under its gravitational attraction. Laplace's hypothesis has since been abandoned. While it may be true that stars originate from nebulae in

ment based by laws of reason on other propositions already accepted, or, more particularly as axiomatic, resulting from the evidence of 'common sense.' Mathematical conclusions are thus necessary; in the latter case, e.g., that two straight lines cannot enclose a space. Among the anc. philosophers and medieval schoolmen appeal to N. was extremely frequent, but with the advent of natural science and its inductive processes, dating from Bacon's *Novum Organum*, a vast class of



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THE GREAT NEBULA IN ORION
60-in reflector at Mount Wilson.

the manner indicated by Laplace, this accounts only for the creation of our sun. According to Sir James Jeans's tidal theory, the solar system was created from the original sun by the close approach of a larger star that raised tides of such violence in the sun as to cause fragments to be torn off it to form the planets, comets, etc., that with the sun constitute the solar system (*q.v.*). Many years ago this theory was shown by Prof. H. N. Russell, an Amer. astronomer, to be untenable. Although several other theories have been advanced, these have not been accepted, and the origin of the solar system still remains one of the unsolved problems of astronomy.

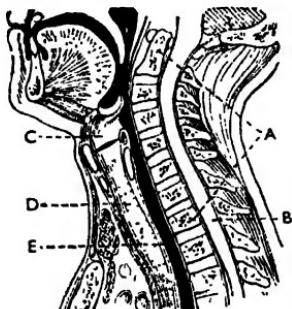
Necessaries, *see INFANT and HUSBAND AND WIFE.*

Necessity, specialised term in philosophy, religion, and logic implying causality and certainty when not deduced by restricted laws of formal reasoning. Logically the law of N. compels us to admit the truth of a conclusion or judg-

necessary truths has been brought within the realm of logical demonstration, or embraced within the realm of theory, i.e. subject to further investigation. It is, however, in philosophy and religion that the doctrine of N. assumes importance, greater perhaps since the rapid rise of the theory of evolution and its popular exaggeration over too wide a sphere. N. would imply mechanical processes, as it were, in the whole universe a view generally held to be incompatible with the operations of human and divine will. But for moral N. see WILL, DETERMINISM, KANT, LEIBNIZ, CALVIN, etc.; also PSYCHOLOGY.

Neck, portion of the body joining the head and trunk, also a constricted portion of any structure serving to join its parts. The bony structure of the N. is the cervical portion of the spinal column, consisting of seven vertebrae. The spinal column contains the spinal cord, which in the cervical region is oval in section; the amount of grey and white matter becomes

increased in quantity. The blood is carried to the skull by the right and left common carotid arteries, and is returned by the jugular vein, which may be felt a little below and behind the angle of the jaw, after which it penetrates rather more deeply into the tissues. The N. also contains the gullet or food passage and the windpipe. The larynx, or organ of voice, occupies a position where the windpipe connects with the pharynx, and the form of one of its cartilages produces the projection known as Adam's apple.



DIAGRAMMATIC SECTION OF THE NECK

A, cervical vertebrae; B, spinal cord, C, larynx, D, trachea; E, oesophagus.

Neck, in geology, the name given to columns of cooled lava which fill up an old volcanic chimney or crater. Up these passages or conduits volcanic materials were forced. Ns. are characterised by a more or less encular pipe filled with consolidated ashes, or with crystalline lava. They vary considerably in size, from 20 yds. in diameter to say miles, and may be simple or complex in structure. They occur in all old volcanic dists., examples existing at Largo Law, Fifeshire; Arthur's Seat, Edinburgh; Dumbarton Hill; the Lothians; Derbyshire; in Auvergne; the Eifel; Bohemia; St. Lucia (W. Indies, 'the Pitons'); Texas; California; and many of the W. states of N. America. The famous diamond mines of Kimberley, S. Africa, are another example, the blue-ground (serpentinite breccia) occupying great funnel-shaped spaces. See Sir A. Geikie, *Treatise on Geology*, 1882, 1924.

Neckar, Ger. riv., trib. of the Rhine, rising in the Black Forest, S.W. Württemberg, and winding N.W. past Cannstadt, Ludwigsburg, Heilbronn, through Baden to Heidelberg and Mannheim, where it joins the Rhine. It is navigable, for small vessels, as far as Cannstadt. Length 246 m.

Necker, Jacques (1732-1804), Swiss financier and statesman of France, b. at Genova. Sent to Paris in his youth he joined the house of Thellinsson, the banker, who took him into partnership. In the course of twelve or thirteen years N. acquired a large fortune and retired. He

then began to aspire to official situations, and wrote several works on financial affairs. His *Éloge de Colbert* obtained a prize from the Fr. Academy. He afterwards wrote a memoir upon the Fr. finances, which so delighted Maurepas that he obtained for him the appointment of director of the Treasury (1776) and director-general of finances (1777), when, being averse to imposing new taxes, he endeavoured to make up the deficiency in the income by economy and loans. In 1781 he pub. *Compte rendu présent du roi*, which disclosed the state of the revenue and expenditure of France. Being refused a seat at the council, he resigned in 1781, withdrew to Switzerland, and wrote *De l'administration des finances de la France* (1784). N. returned to Paris in 1787 and wrote against Calonne; in 1788, on the resignation of Brienne, Louis XVI. appointed N. director-general of finances. His second ministry was short, and he retired to Switzerland, but after the taking of the Bastille the National Assembly demanded the recall of N., and Louis complied. He resigned in 1790, and spent his remaining days in Switzerland, writing political tracts. His daughter was the celebrated Mme de Staél. The memoirs of his private life were written by her, and the *Vérité sur la vie de M. Necker*, by his grandson (1820-21). See C. A. Samte-Beuve, *Causeurs du Lundi*, (vol. vii.), 1853; P. de Segur, *Au Couchant de la monarchie Louis XVI. et Necker*, 1776-81, 1913; O. d'Haussonville, *Mme de Staél et M. Necker d'après leur correspondance inédite*, 1925.

Necker, Suzanne Curchod, Madame (1739-91), Fr. writer, b. at Geneva-Switzerland, noted for her beauty, wit, and wide learning. After her marriage in 1764 to Jacques N., her house in Paris was the rendezvous of all the distinguished men of the day. She wrote *Réflexions sur le divorce*, and *Mélanges*, pub. by her husband after her death. She was the mother of the famous Mme de Staél. See G. Parry, *Mme Necker, her Family and her Friends*, 1913.

Necklace Diamond, see DIAMOND NECK-LACE.

Necromancy, mode of divination practised by the ancients by which the spirits of the dead were conjured up to answer certain questions about the future. In Homer's *Odyssey* the shade of Tiresias is brought up and consulted by Ulysses, and the witch of Endor is an example from O. T. hist. See DIVINATION.

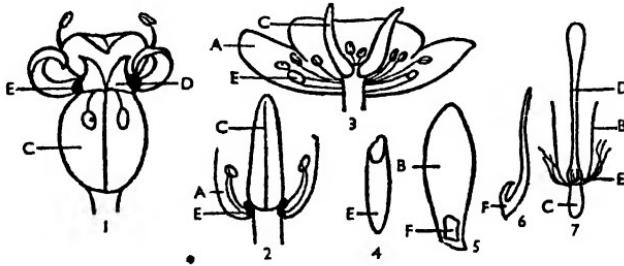
Necropolis (Gk. *κορμός*, and *πόλις*, city of the dead), cemetery or burying-ground. The name was formerly applied to cemeteries in the vicinity of ancient cities, especially to a suburb of Alexandria, but is now used in a more extended sense for any large burial-ground. Ancient examples remain in Africa (Cyrene and the Egyptian Pyramids), Asia Minor, Greece, and Italy. See A. Brückner, *Friedhof aus Eridanos*, 1909; R. Pagenstecher, *Nekropolis*, 1917; and G. Karo, *An Attic Cemetery*, 1943.

Necrosis, death of cells surrounded by living tissue, more properly the death of

an aggregation of cells, since individual cells are constantly dying in the normal course of bodily activity. The causes of N. are direct injury, obstruction in the circulation of the part, or incompetence in the nutritive agencies in the tissues affected. Cheesy N. is produced by the action of the tubercle bacillus. In coagulative N. an amount of fibrin is formed; this occurs in the blood and on the surface of mucous membranes, where a false membrane may be formed, as in diphtheria. In liquefactive N. the action of the cells gives rise to the formation of liquid. See CARIES and GANGRENE.

ventilation and liberal watering are provided, and over-cropping is avoided. See PEACH.

Nectary, usually a gland-like nectar-secreting body or disk on the receptacle of a flower, either between the petals or between the stamens and pistils. In some cases the N. occurs on the summit of the ovary; in others it lines the inside of the calyx-tube; and occasionally sepals or petals are modified, and in a few cases (such as the monkshood, Christmas Rose, and hellebore) are entirely converted to serve as Ns. The accessibility of the N. is perfectly adapted to the structure of the



NECTARIES

A, sepal; B, petal, C, ovary; D, style; E, nectary; F, scale covering E.

(1) Section of Umbellifer: the nectary is a disk formed from the swollen bases of the styles; (2) Wall-flower: nectaries lie internal to the base of the stamens; (3) Christmas Rose: nectaries are tubular petalas; (4) Tubular petal from (3); (5) Petal of Lesser Celandine, front view; (6) Side view of (5); (7) Coltsfoot, disk floret; nectary lies within the corolla tube at the base of the style.

Nectar, sweet juice which many plants secrete in special gland-like bodies called nectaries. Its real use seems to be to attract insects and thus to secure cross-pollination. N. is composed of cane-sugar and uncrystallisable sugar. It should not be confused with honey, which is formed from N. in the stomach of the bee, by the action of the enzyme invertase, which converts the cane-sugar into glucose and fructose. The resulting honey is then regurgitated into the cells of the comb. Also the drink of the gods, described by Homer as a red wine which Hebe pours out for the immortals (*Iliad* xix. 3x and iv. 3). N., in Gk. mythology, had the power of conferring immortality on all who partook of it. The term is applied figuratively to any delicious drink, such as that made from sweet wine and honey.

Nectarine, smooth-skinned and generally more crimson-coloured variety of the peach, which can often be grown successfully outdoors against a S. wall, in a well-drained border of fibrous loam containing a good proportion of lime. Protection at the time of flowering against spring frosts and cold winds is very essential, as the flowers appear early and before the leaves. Planting is best done in Sept., against walls, trees trained fan-shape are best. The culture of Ns. under glass, particularly when grown in pots, is attended with excellent results, if free

insect or other agent on which the pollination of the flowers mainly depends.

Nedim (fl. c. 1700-30 under Ahmed III.), Turkish poet of the eighteenth century, of the old Ottoman school. His 'ghazels' and 'kasidas' are marked by grace and originality. He was custodian of the library at Constantinople, founded by Ibrahim Pasha. See L. F. Poole, *Story of Turkey*, 1888.

Needham, tn. of Massachusetts, U.S.A., in Norfolk co., 12 m. S.W. of Boston, with hosiery manuf. Pop. 12,400.

Needle Gun, see under GUN and RIFLE.

Needle, Magnetic, see COMPASS.

Needles. There are seven different groups of N. which may be listed as follows:

Hawd-serving Needles. -Prior to the Second World War these were manufactured in quantity in Japan (6,500,000,000 per month); Germany (2,000,000,000 per month); and the United Kingdom (650,000,000 per month). Since the Second World War manuf. of N. in China has very greatly increased, but no reliable figures are available. Eng. manuf. of N. is concentrated at Redditch in Worcestershire. Sewing N. are made from five-gauge carbon steel rod, which is drawn down to the requisite thickness by a series of holing and annealing operations. The resultant wire is then cut into two-needle lengths, sharpened at both ends by automatic grinding, and passed into the making shop, where the N. are loaded into

combine machines, set up for the particular type and gauge required; these grip each needle individually in a wormed food, and carry it between two stamping dies, which mark the impression of two eyes, facing in opposite directions, in the centre of the two-needle length. The wire is then carried forward on the same feed and the centre of each eye is punched out cleanly, the flash clipped off, and the wire broken apart in the centre to form two N. Tied into bundles of approximately 50,000 the N. are then passed over rotary grinding wheels which, working with extreme accuracy, remove all remaining roughness around the head and eye. Hardening and tempering are done in electrical furnaces which, by being kept air-sealed, keep the surface of the needle bright throughout the heat treatment. To remove all signs of grinding, stamping, or scale, the needle is then submitted to a particularly individual process known as 'scouring.' The N. are wrapped in long cylindrical parcels of hessian with a dressing of liquid soap and emery powder. This parcel is then bound together with cord and placed between one stationary and one sliding surface, which roll the parcel backwards and forwards between them under very considerable pressure for many hours. On this removal the N. are polished in a similar machine, cleaned, and nickel plated. Each needle is then inspected by hand and any necessary finishing, such as gilding, bluing, etc., is carried out. Finally the N. are either stuck in cloth, or packed loose into packets for final dispatch to the customer.

Hardware Needles.—Prior to the Second World War Germany was the greatest manufacturer of these, followed by Great Britain; but since the Second World War China has also started their manuf. The term covers all special N. used by trades other than tailoring or dressmaking, such as shoemakers, upholsterers, mattress makers, sail-makers, etc. Their manuf. is comparable to hand-sewing N., with which they overlap at certain points.

Hosiery Needles, or Latch Needles.—The chief manufacturer of these N., used on industrial knitting machines, is Canada, followed by Germany, Great Britain, and Switzerland. In the finer sizes their production calls for great accuracy and craftsmanship, but it is not individual in the same way as needle making, and has more in common with normal light engineering.

Surgical Needles, or Suture Needles.—These are made in Germany, Great Britain, and in small quantities in America. All surgical needles have triangular cutting points, similar to glovers' needles. This is to minimise tearing of the skin. They may either have an eye, similar to hand-sewing N., or be eyeless, as in non-traumatic N. where the gut is attached permanently to the body of the needle so that no eye is necessary.

Knitting Needles.—Manuf. of these is confined to no particular country, since the processes are very simple, particularly when worked in plastic. For ordinary

domestic knitting they are made of anodised aluminium, plastic, nickel-plated steel, bone, or wood.

Machine Needles.—Manuf. of these N. is in many ways comparable to that of hand-sewing N., and prior to the Second World War 80 per cent of the whole production was concentrated in Germany, the remainder being made in the U.S.A. and a few in Great Britain.

Gramophone Needles.—These are really a by-product of the hand-sewing needle industry, and are manufactured wherever these are made, notably in Japan, China, Germany, and Great Britain.

Needles, The.—The name given to five remarkable rocks lying immediately off the W. extremity of the Isle of Wight in N. lat. 50° 39' and W. long. 1° 34'. Their origin is attributable to the sea beating on the sharp cliffs which form the W. point of the is., and the same influence is gradually wasting them away; the largest of them, which was 120 ft. in height, was undermined and fell during a storm in 1764. They are white, but black at their bases, and curiously streaked throughout with black strata of flints. A lighthouse standing on this extremity of the is. rises 715 ft. above the sea.

Needlework, work done with a needle and thread on cloth. Since sewing machines, invented in 1830, came into general use at about 1870, machine-sewing has superseded much that was done in the past by hand, but plain hand-sewing is the foundation of all other needlecraft. N. is one of the oldest crafts, and though it is primarily employed to join pieces of material to make a garment, it is also used for forms of decoration, e.g. tucking. Two classes of stitches are used in garment-making, temporary and permanent. The temporary stitches are straight-tacking, and tailor-tacking or thread-marking, the latter being used for marking the fitting line on two identical parts at the same time. There are a number of permanent stitches: these are used for joining parts of garments, for holding down turned edges, for protecting raw edges, for disposal of fullness, and for decoration. Permanent stitches include running, oversewing, ordinary hemming, slip hemming, invisible hemming, herringbone stitch, and buttonhole stitch. Featilir-stitching and scalloping are particularly decorative forms of permanent stitching. The same form of seam is used throughout a garment, the choice of seam depending on the nature of the material and the purpose of the garment. Fr. seams, for example, are used in materials that are not too thick and bulky, such as thin lingerie and outer garments of transparent material, e.g. nylon. A run and fell seam is used when a strong flat seam is required, one row of stitching being visible on the right side. Flat seams should always be used on garments which are to be worn next to the skin in order to avoid friction, and the seams should fall to the back. Open seams are frequently used on outer garments, and no stitching shows on the right side, and the seams can be pressed

open so as to be almost invisible. Raw edges inside the garment can be made neat by cutting a tooth-like edge, or by using a narrow binding.

Darning and Patching. - Some knowledge of patching and darning is indispensable in the home. Patching is generally applied to outer garments and large repairs to under-garments; darning is used on knitted fabrics. In all repair work the general condition of the garment, the cost of replacing it, and the time to mend it, are factors in governing the choice of method, which is as important as suitability of method to material. Special attachments, which can be used on a sewing machine, e.g. a darning foot, facilitate repair work. Darning is a method of replacing worn threads, as distinct from patching, which is the insertion of whole pieces of material, and can often be made less obvious than patching. The hole or thin place is filled with threads carefully chosen to reproduce as nearly as possible the original web. Swiss darning is frequently employed to repair a hand-knitted garment, as actual new knitting stitches are made. The general principles of patching are similar to those of darning, i.e. the material of the patch is chosen to match that of the garment in colour, texture, and age. The patch is generally placed on the wrong side of the garment. Adhesive patches can now be bought.

Good N. is an essential foundation for the more exacting and complex stitches used in various types of embroidery and other needlecrafts. See also DRESS-MAKING; EMBROIDERY; LACE; SAMPLER. See E. Griffith, *A Manual of Plain Needlework*, 1931, 1944; Gladys Fry, *Embroidery and Needlework*, 1935; Anna L. Hird, *Principles and Practice of Needlework and Dressmaking*, 1942, and *The Vogue Manual of Dressmaking*.

Neenah, city and summer resort of Winnebago co., Wisconsin, U.S.A., on Fox R., N.W. of Lake Winnebago. Pop. 16,400.

Neer, Aernout van der (1603-77), Dutch landscape painter, b. at Gorkum. He was particularly successful in rendering moonlight effects among the canal scenery of Holland, and in painting winter landscapes, with skaters on ice.

Neer, Egton Henrick van der (1634-1705), son of Aernout, b. at Amsterdam. He was a pupil of Vanloo, and became celebrated as a painter of historical pieces, landscapes, etc.

Neerwinden, vil. of Liège, Belgium, 5 m. S.E. of Tuirleumont. It was the scene of two battles fought in 1693 and 1793.

No Exeat Regno. At common law (q.v.) every subject may go out of the realm whenever and for whatever purpose he pleases; but because constitutionally every man ought to defend the realm, the sovereign has the prerogative (see under CROWN) of commanding him by the writ of N. E. R. not to leave the country, on pain of punishment for disobedience. This ancient writ was originally used to prevent the clergy from going to Rome, and was afterwards extended to laymen who were suspected of concerting schemes against

the state. It has now become a part of the ordinary process of the high court by virtue of which bail (q.v.) may be obtained from any person about to go abroad with the object of evading the jurisdiction of the court. The legality of this application of the writ was settled in the time of Charles II.

Neferiti, wife of Sakere, king of Egypt in the eighteenth dynasty. A remarkable sculptured head of the queen, one of the finest extant specimens of Egyptian art, was discovered at Tel el Amarna, and is now preserved at Berlin. Reproductions have made her perhaps the most dramatically real of all the great beauties of the past.

Negapatam, or **Nagapattanam**, chief seaport of Madras, India, one of the earliest Portuguese settlements on the Coromandel coast. It is in the delta of the Cauvery, 18 m. from Tanjore. Oil and textiles are manufactured, rice and paddy exported. The S. Indian Railway has extensive workshops here. N. is an important coolie labour exchange. Pop. 49,000 (mostly Hindus and Muslims).

Negaunee, city of Michigan, U.S.A., 11 m. S.W. by W. of Marquette. It is a summer resort. Pop. 6800.

Negeb (Negev), The, semi-desert, triangular-shaped region of Palestine, extending from a base S. of Beersheba to an apex at the head of the gulf of Akaba. Its name, the Negeb means, in Heb., the 'south country' and tradition has linked it with early biblical hist., as, for example, in the story of the casting out of Hagar in the 'wilderness of Beersheba', the 'wilderness of Judah' in relation to David; and Solomon's navy of ships in Eziongeber - a site on the coast N. of Akaba. In the time of the Nabatean kingdom which occupied what is now S. Transjordan, trade routes were developed across the Wadi Araba and the waterless desert of the Negeb, and along its length, in the N. Negeb, townships sprang up. The ruins of their civilisation - with great cisterns for the storage of drinking water - were excavated forty years ago by Sir Leonard Woolley (q.v.) and T. E. Lawrence (q.v.). But thereafter the Negeb and its inhab. dwindled into obscurity, the modern nomads, to the number of about 10,000, wresting a hard living from goats and camels, and, up to the time of the British mandatory rule in Palestine, no attempt was even made to register the lands of these tribal nomads or their limits. The area of the Negeb is about 1500 sq. m. The Negeb stands comparatively high on a wind-swept sun-scorched plateau which slopes up gradually from the foothills of the Sinai frontier to the high cliffs to the E. that overlook the Wadi Araba. It tapers from the S. Judean hills around Beersheba down to its narrow sea-frontage on the gulf of Akaba 70 m. distant, the width of the plateau varying from 40 m. in the N. to only a few miles on the gulf of Akaba itself. It is a most unattractive region, but circumstances have combined to make it politically and economically significant.

In 1930 Sir John Hope Simpson, on

behalf of the Brit. mandatory gov., visited Palestine to report on the availability of cultivable lands for close settlement by the Jews in relation to the national home. His report declared that there was an inexhaustible supply of such land in the Beersheba area given the possibility of irrigation. The Palestine Gov. built a dam and reservoir in Beersheba but this proved ineffective. It then tried to develop water supplies from well-boring, but the supplies were so impregnated with mineral salts as to be useless for crop irrigation or human consumption. The Jewish experts, however, do not accept these findings and Zionist opinion still claims that the Negeb can be the great settlement area of the future. The original United Nations Assembly's resolution of Nov. 1947 on the partition of Palestine gave W. Galilee to the Arabs and the Negeb to the Jews. As a result, however, of the first fighting between the Jews and the Arabs, the Jews occupied most of Galilee and lost most of the Negeb. In this situation Comt. Bernadotte (*see PALESTINE, History*) went to Palestine as mediator and recommended in his subsequent report to the United Nations that the Jews should keep W. Galilee in return for the Negeb, which would be given to the Arabs. After that the Jews determined to fight for the Negeb. In Oct. 1948 the truce arranged through Bernadotte was broken and in two short almost bloodless campaigns they occupied nearly all the Negeb and, in spite of resolutions of the United Nations against it, claimed the rights of a victor nation to retain what they had won. The question may be asked why the Jews are anxious to retain so inhospitable and unattractive a land. The reasons were stated by Mr. Shertok, Israeli foreign minister (Nov. 15, 1948). He said that Israel needed the Negeb because it was the only area in Palestine with large-scale colonisation and the development of the Negeb was decisive for the future of Jewish immigration into Israel. Further, Israel was entitled to access to the chemical wealth of the Dead Sea which the Jews had made productive. The Negeb was also vital to Israel because of the outlet for Dead Sea produce through the gulf of Akaba, which was Israel's gateway to the E. seas. Roads in the Negeb are few and the wastes of sand dunes are marked only by goat and camel tracks. But under the barren hills with their thorny scrub are buried such forgotten civilisations as the ancient city of Lachish (*q.v.*). Where yesterday the only human life was an occasional cluster of Bedouin black tents, to-day thousands of young Jewish men and women are sinking wells and cementing great rain traps. But here, as elsewhere in Palestine, the physical problem is allied to the political. No real development is possible in the Negeb until a lasting settlement has been reached with Transjordan and the waters of the Jordan can be tapped to irrigate the parched soil. On the Arab side, however, it is thought that this Jewish settlement talk is a mere pretext and that the state

of Israel has deep expansionist Middle E. (*q.v.*) designs--for which Beersheba and Akaba are needed as bases. *See also ISRAEL.*

Neghelli, Marchese de, *see GRAZIANI.*

Negligence. In Eng. law the commonly accepted definition of N., which is a tort (actionable wrong) remediable by an action of damages, is that it is the omission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do. The two cardinal facts of importance about N. are that it denotes a standard of conduct and not a state of mind, and that liability from it arises only where a duty is owed to the person aggrieved. In regard to duty, liability for N. may arise from the breach of duty owed to a particular individual, or to all persons indiscriminately. In the former case the personal duty may either be incident to some fiduciary (*e.g.* trustee and beneficiary), parental, or tutelary (guardian and ward) relationship, or exist by reason of a purely contractual relationship. In the case of N. manifested in the performance or omission to perform the terms of a contract, difficult questions arise as to whether the injured party should sue in contract or in tort, the practical difference being that the measure of damages in the former case will be the loss he may be reasonably supposed to have sustained as a proximate consequence of the breach (*q.v.*), but in the latter case he may get anything a sympathetic jury sees fit to award. In regard to duties 'owed to all the world,' it is to be observed that these are necessarily of a restricted nature; and the bond of duty in most cases where the courts have held it to exist will be found to depend really on an antecedent voluntary act of the party held liable; *e.g.*, if I observe my art and horse, the driver of which (a personal enemy of mine) has temporarily left it unguarded, proceeding to the brink of a steep cliff, *i.e.*, not liable for damages for N. because I did not take the trouble to stop the horse from walking over the cliff. But if, for example, I choose to run motor-buses or any other vehicle along the streets, I am responsible for any injury sustained thereto by passers-by which a jury or judge of fact is satisfied were due solely to the N. of my drivers. This example is useful to illustrate the meaning of 'contributory' N.; a person who might otherwise be entitled to damages for injuries or loss sustained by the N. of another was entitled to recover a farthing if, notwithstanding the other's N., he himself could, at the decisive or last moment in the transaction, have by the exercise of reasonable care and prudence averted such injury or loss. By the Law Reform (Contributory Negligence) Act of 1945, however, such a person is now entitled to recover damages though the amount is reduced proportionally to his share of responsibility. It is commonly said that N. is divisible into gross, slight, ordinary, and so forth. But the div. is unsound and

illogical. No doubt what would be gross N. in a bus driver would be usually far less so in the case of an inexpert man who was learning how to drive. But this will not affect the liability, for the law requires the standard of care or skill of the export in a case where special skill is ordinarily to be expected; though, of course, in the above example the inexpert driver would probably incur no liability if, for example, he were a passenger who had tried to stop a bus in the sudden illness of the regular driver.

Negombo, tn. of Ceylon, on the W. coast, 20 m. N.W. of Colombo. There is trade in cinnamon and a fishing industry. Pop. 25,200.

Negotiable Instrument. The distinguishing features of a N. I. are: (1) It can be sued on by the holder in his own name; (2) the holder in due course is not affected by defects in or lack of title of his transferor or previous holders; (3) property in it passes by mere delivery; and (4) the holder in due course is not affected by certain defences which might be available against prior holders, e.g. fraud, undue influence, provided he himself were no party to such vitiating element. The law of N. Is. depends mainly upon statutes which themselves have been framed exclusively on the custom of merchants. The earliest forms of N. Is. were bills of exchange (*q.v.*), borrowed from the practice of Venetian and Florentine merchants in the Middle Ages, and, though much later, promissory notes. The list of N. Is. tends to increase, one of the latest additions being debenture bonds payable to bearer. In the majority of cases it is essentially a question of fact to be proved by evidence whether or not a document is negotiable, though in cases where the negotiability is established, the court takes judicial notice of that fact, i.e. recognises it as a matter of law. The following documents, in addition to those already mentioned, are N. Is.: bank-notes (*see also CURRENCY*), cheques, exchequer bills, dividend warrants, E. India bonds, circular notes, certain scrip and bonds, e.g. debenture scrip and various Amer. railway bonds (as to the marks of a valid custom see under that title). The law of N. I. in so far as bills of exchange, promissory notes, cheques, and bank-notes are concerned has long been codified in the Bills of Exchange Act, 1882. Postal orders are not negotiable if crossed for collection by a bank, though otherwise they can be freely transferred from hand to hand; nor are share certificates, share warrants, and share transfers, hence the forgery of the true holder's signature will not affect his rights; nor an IOU (*q.v.*); nor most kinds of scrip and bonds. Bills of lading can be transferred so as to give the transferee a right to sue in his own name, but otherwise they are not N. Is., because the transferee gets no better title than that of his transferor; and the same observations apply to policies of assurance. The holder in due course of a bill of exchange or any other N. I. is he who takes the instrument in good faith or without knowledge or notice of previous

defects of title in it, and gives valuable consideration (*see under CONSIDERATION*) for it. But a holder is not put to the trouble of proving consideration unless the party resisting liability on the instrument estab. the existence of some defect, e.g. fraud, duress. In the previous negotiation of the instrument. Sometimes bills or other N. Is. are marked 'not negotiable.' The effect of this is that the person receiving it will not have, and is not capable of giving, a better title to the instrument than that which the person from whom he took it had. But though the true owner is thus protected, the negotiability of the instrument is not otherwise affected.

Negri, Ada (1870-1943), the only It. poetess to whom the critics of her native land have given the title of 'great.' b. at Lodi. She came from a working-class family and was a school teacher at first in a Lombardy vil. and later at Milan. She married a rich business man, from whom she soon separated. Her first book of verses was pub. when she was only seventeen, and her success was rapid. Her early books were the chants of an authentic daughter of the people, and were filled with a sense of revolt at things as they are. In her later vols. her rhymes lost some of their spontaneity and became more classical in form, although her themes were still humanitarian and feminist. Among her books of poems were (titles trans.) *Fatality* (1892); *Tempests* (1896); *Maternity* (1904); *Ecce!* (1914); and *Prayers* (1918). The shock of the First World War turned her talents to prose. *The Book of Mara*, which appeared in 1919, recites with feminine audacity the death of a young lover. In *Stella Matutina* (1923) she gave a lyrical evocation in poetic prose of her infancy. See studies by N. Podenzani, 1930, and V. G. Galati, 1930.

Negrillo, see NEGRITO.

Negri Sembilan, smallest of what were once classified as the four Federated Malay States under Brit. protection. It is situated on the W. coast of the Malay Peninsula to the S. of the Malay states of Selangor and Pahang. Its area is about 2600 sq. m. Its pop. of about 230,000 consists of Chinese, Malays, Tamils, Europeans, and Eurasians. It is bordered on the N. by Selangor, S. by Johore and Malacca, E. by Pahang, and W. by the straits of Malacca. It has a coast-line of about 29 m. Its surface is diversified. The upper valleys and mts. are densely wooded, the lower are fertile, producing rice and fruits in abundance. The main mt. range of the Malay Peninsula ends in Negri Sembilan and the watershed between the E. and W. coasts in the S. part of the state is not inconsiderable. Gunong Besar Hantu, on the Pahang border, is the highest peak (4799 ft.), while the highest peak within the borders is Telapak Buruk (3915 ft.). The country is drained eastwards by the R. Moar, but there are no large rvs. and the state does not suffer from disastrous floods which at times affect the riv. valleys of Malaya. There is only one port, Port Dickson, which

is connected with the seat of government, Seremban, by a railway 24½ m. in length. Agriculture is the main industry. Tin is worked in considerable quantities and large numbers of elephants, buffaloes, and other cattle are reared. Negri Sembilan is a confederation of 'nine states.' Sungai Ujong, one of the larger of these, is mentioned in a Javanese poem in A.D. 1305 as being subject to the Javanese empire of Majapahit (see also under MALAYA, History). In the fifteenth century it was ruled by chiefs of the old kingdom of Malacca. Most of the Malays are descendants of immigrants from Manangkabau in Sumatra and have an interesting exogamous and tribal social organisation. This immigration seems to have begun in the sixteenth century. After the capture of Malacca from the Portuguese by the Dutch and Johore Malays in 1641, Johore took a leading part in the politics of Negri Sembilan until 1773, when the chiefs of the present-day leading states of the confederation invited a Sumatra prince, Raja Melewar, ancestor of the present ruler, to preside over the confederation. In 1874 the president, or *undang*, of Sungai Ujong (the most important of the nine small states) invited the assistance of the Brit. Gov. to maintain his rule, and a resident was appointed, and various others of the nine states followed this example. Later was formed a confederation known as Old Negri Sembilan, and in 1895 the resident of this confederation took charge of Sungai Ujong and of Jelebu, and the modern Negri Sembilan was constituted. Finally in 1898 the Yang Di-pertuan of Sri Menanti (who at one time presided over the whole of Negri Sembilan) was again elected titular ruler of the whole state.

Negrito, or Negrillo, name originally applied by the Spaniards to the Negro-like inhab. of the Philippine Is., an aboriginal race, somewhat dwarfed, inhabiting the mts. They are of an extremely low type, having no dwellings, living on wild fruits and roots, and on animals they can procure with their only weapon, the bow and arrow. The name has been extended to cover many other peoples. Besides the *Aetas* or Philippine Negritos, there are many tribes scattered over the mountainous regions of the Malay Peninsula, such as the Jakuns, Sakais, and Samangs, and the Andaman Islanders or Mincopies who are much purer than the others who have intermixed with the Malay races. These form the E. div. of the race. In Africa there are sev. tribes inhabiting the equatorial forests and the mountainous regions round the great lakes, the pygmies of the Congo and Ogoway. Among these are the Wochua and Akka, inhabiting the basin of the R. Welle, N. of the Congo; the Batwa, about the R. Kasa and its trib.; the Obongo, in the W. forests of equatorial Africa; in Masaland the Wandirobo; and in S. Galla-land the Dume. As in the case of the Negroes, this race appears to have spread originally over the Indo-African continent, now submerged. There is marked likeness to the Negro in colour,

nature of the hair, protruding jaws; they are, however, of low stature, 3 ft. 6 in. to 4 ft. 10 in., and have 'brachycephalous' heads. In intelligence and morality they show marked similarity to the Negro, but are very much lower in the scale. See A. B. Meyer, *Über die Negriten oder Artas der Philippinen*, 1878; E. Tyson, *Essay concerning the Pygmies of the Ancients*, 1894; A. H. Keane, *Man, Past and Present*, 1900; W. Juncker, *Travels in Africa*, 1900-1902; H. Spencer, *Descriptive Sociology*, 1925; I. H. Evans, *Negritos of Malaya*, 1937; and P. Schebesta, *Revisiting my Pygmy Hosts*, 1937.

Negro-African Languages. The African natives speak very many different languages and dialects, whose relationship has, as yet, not been estab. Nor is the exact number of the languages certain, as it is not always easy to distinguish between language and dialect. Various estimates ranging from 500 to 1000 have been made, but a great majority of them are confined to quite small tribes, and only about 250 have been written down. Besides, migration has produced mixed languages and dialects which cannot be easily classified. Finally a few languages may be considered as a kind of lingua franca; they are understood over wide areas and serve as a common language between groups belonging to different linguistic families. Such are Hausa in W. Africa, Swahili in E. Africa, and Yoruba and Ibo in Nigeria. However, for convenience we can classify the African native languages into five linguistic families. One of them, extending in broad lines to the N. and E. of the Sahara, forms a great part of the Semitic-Hamitic family (see under SEMITIC-HAMITIC LANGUAGES). The following are the other four:

Bushmen and Hottentots.—Their language is of a most primitive form, primarily monosyllabic, and characterised by a curious 'click' prefixed to most of their words. It gives their spoken tongue a staccato sound.

Bantu.—According to Sir Harry H. Johnston, there are to-day 226 distinct Bantu languages spoken over nearly the whole of the S. third of Africa, and constituting a very distinct type of speech. Contrasted with others among the groups of Negro tongues, it is remarkable as a rule for the Italian melodiousness, simplicity, and frequency of its vowel sounds, and the comparative ease with which its exemplars can be acquired and spoken by Europeans. The Nyanga dialects, which employ Rom. characters, are spoken by over 1,500,000 people, and are the most interesting group of this linguistic family. They are mainly spoken in the Nyassa Protectorate, lying between Lake Nyasa, N. Rhodesia, Tanganyika Ter., and Portuguese E. Africa. The most important Bantu language is Swahili, mainly spoken in Zanzibar; it employs the Arabic alphabet and has become a kind of lingua franca in E. Africa.

The Bantu and the Sudanese (see below) languages are remarkable for the fact

that they are prefix-prenominal tongues, that is, they employ prefixes instead of suffixes to indicate tense, declension, and so forth, to an extent unparalleled in any other linguistic family. These prefixes, constituting the concord class, recur in exact agreement in the subject noun, and in the other members of the sentence, i.e. in the adjectives, verbs, verbal objectives, and all the other qualifications. In other words, the prefix of the first word of the sentence (that is, the basic nominal concept) must also be the prefix of all the other words of this sentence, thus producing an alliteration similar to but much more monotonous than that of old Eng. poetry. Another important characteristic of Bantu and Sudanese is that the conjugation of verbs shows aspects of action rather than the time relations as in Indo-European languages. Thus it shows completeness, emphasis, continuity, negation, and other relations, but not very many temporal ones. There is a certain parallel to this in Semitic languages.

Sudanic, or Sudanese, or Sudanes-Guinian.—Languages belonging to this linguistic family are mainly spoken in the area between the Sahara and the equator from the upper Nile to the Gambia and Senegal. There is a great mass of what are rather dialects than languages, and the interrelations of these forms of speech, and their relations with the Bantu languages and other tongues of the African continent, are very obscure.

The Yoruba, a higher-grade and commercially minded people, numbering about 3,000,000, inhabit the S.W. corner of Nigeria from the sea to Jebba and from Dahomey to the borders of the Bini state. Nago of the Dahomey coast region, and the Bini tongue, seem to be related to Yoruba. Ybo, spoken in E. Nigeria, ranks as another chief language of Nigeria. Twi (originally Kwi or Okwi), also known as Oji, Odshi, Tyl, Chweo, Tshi, Amiri, Ashanti, etc., is another 'typical' Sudanic language. It is spoken by about 1,000,000 people living in the Gold Coast colony and in part of the Fr. colony of the Ivory Coast. Like most African languages, it is divided into a number of dialects, the most important of them being Akuapem, Asante, Akwam. The Twi group of languages and the closely related Fante tongue belong to the Akan linguistic group. Efik, another interesting Sudanic language, is spoken by some 50,000 people in Calabar. Nigeria, Yoruba, Twi, and Efik were reduced to writing over a century ago. Mandingo, Kru, and Kpwe represent the three main types of Nigeria. There are many other language and dialects belonging to this linguistic family, but the majority of them, though important from the linguistic or anthropological points of view, have no great importance for practical purposes.

It has not yet been estab. whether the Bantu and the Sudanic languages actually form distinct families or should be considered as sub-families of one family. While they have common characteristics of grammatical structure (see above),

their phonology and vocabularies are quite distinct.

Nilotic Languages.—This group also offers many problems, especially with regard to its relationship with the Hamitic-Cushitic tongues (see SEMITIC-HAMITIC LANGUAGES). Mention may be made of some of the Nilotic-speaking tribes, such as the Nuer, living S. of the Sudan, in the flat country watered by the White and Blue Nile (N.E. Africa), and the allied peoples Dinka and Shilluk, also living in the upper Nile region. The important people of the Masai (E. Africa and E. Central Africa) and some other tribes are considered as representing a fusion of Hamites with Nilotic Negroes. The Ba Hima and Wa Tusi tribes (Uganda-Karagwe-Urundi) are considered as a mixed Hamitic-Bantu people.

Bibliography: see under LINGUISTIC FAMILIES. See also LANGUAGES, CLASSIFICATION OF.

Negro Art, see under NEGROES.

Negro, Bush, see MAROONS.

Negro, Rio: 1. Riv. of Argentina formed by the union of the Limay and Neuquen Rts., which rise in lakes in the Andes. It flows E. and S.E., and after a course of 400 m. enters the Atlantic. 2. Riv. of S. America, rising in Colombia, under the name Guatinia. It flows E. and S., joining the Amazon as trib. below Manaus. It is navigable for steamers about 450 m., for canoes 680 m. Total length about 1400 m.; breadth 14 to 15 m.

Negroes form one of the four great classes of the human race. In their purest form they are probably found along the Guinea coast, in the Gaboon, the basins of the Shari and Benue, and the lower Zambezi; but the Sudan is considered the home of the race. It is possible that they peopled Schlieter's 'Lemuria,' a continent covering a large portion of the Indian Ocean, and became divided on the subsidence of the region in early and middle Tertiary times. The term is now generally restricted to the S. or African branch, those of the E. region, of S. India, Malaya, New Guinea, etc., being Papuans or Malaysians. The former present various mixed types due to Caucasian migration, the latter have been affected mostly by Mongolian movement. The Negro characteristics are deep brown, almost black, skin, cool, velvety, and emitting a peculiar odour; short, black woolly hair of elliptical section; short, flat, broad, snub nose with depressed base and dilated nostrils; black eye, black iris, and yellow sclerotic coat; prognathous jaws, facial angle 70°; thick lips, protruding and showing the inner red; high and prominent cheek bones; very thick skull, dolicocephalic (index 70°); cranial capacity, 35 (average European, 45); long arms, weak legs; flat, broad foot with low instep, and 'lark heel'; yellowish palms and soles; height (average 5 ft. 10 in.) above the average. A marked feature is the early closing of the cranial sutures, a premature ossification appearing to prevent a full development of the brain.

The Negro races in Africa comprise the Fulah and Nuba groups, the Bantus, the

Hottentots, and the Malayo-Polynesian groups. In these negroid types there are wide variations, due to differences of climate. The Negroes have been described as unprogressive, lethargic, and without initiative, but unjustly, as Negro labour has always been valued. Slavery has impoverished Africa of some millions of her inhab., and this has checked the progress of the Negro race, whilst the morale of all connected with slavery—slave and slave-owner alike—was inevitably lowered. The status of women among the Negroes is low. Women are bought in marriage, and are expected to work to provide food for the men and the children. Polygamy is customary. Their religion was very debased and cruel, fetishism, cannibalism, and slavery being the chief characteristics and outcomes, but many have become Muslims. In U.S.A. and S. Africa they are largely christianised. They have been described as non-moral, rather than immoral, which aptly expresses their undoubted lower stage of development. They are gay and passionate, of rapidly changing moods; thievish and indolent by nature, their ready submission to authority and their apparent devotion to their masters is unreliable. The number of non-Christian Negroes amounts to about 90,000,000. The education of the Negroes was originally undertaken entirely by the missionaries, but of recent years education has been more systematised and secular schools report considerable progress. It is unfortunate, however, that in the Negro republic of Liberia, with a pop. of some 2,000,000 freed slaves, the Negroes have shown themselves incapable of self-education or of equity. The same applies to the older Negro republic of Haiti. The Negro pop. of Africa is estimated at over 200,000,000.

The Negroes in America. The Negro pop. of America numbers 12,865,500. Most of these are the descendants of the African slaves who were brought to the ter. of the U.S.A., although in the period following the First World War there was a large influx of Negroes from the Brit.-owned W. Indian is. Slavery existed in all the thirteen original colonies which became the first states of the Amer. union, but at least four-fifths were owned in the S. In the cold climate of the N. colonies slavery was not profitable. The small number held, therefore, never presented an acute social problem. It was otherwise in the S., where the Negro could be usefully employed in the great heat of the cotton, rice, and sugar plantations. In none of the colonies did the slaves have many legal rights. In the N. they were mainly domestic servants, humanely treated and instructed in religion and elementary schooling. In Virginia and Maryland they were mainly employed as body servants or as mechanics and artisans on the plantations. They lived in their own huts with their families, and were fairly contented. In the far S. not only was the labour given them harder, but in many cases they suffered under harsh task-masters and overseers,

who were often as cruel to them as depicted in *Uncle Tom's Cabin*. But even in those early colonial days a sentiment began to rise against human slavery, chiefly fostered by the Quakers and Ger. settlers of Pennsylvania. The blame for slavery originally was shared between Eng. traders and the colonists. Various Eng. companies found it profitable to ship slaves to America, even though slavery was not allowed on Eng. soil. At various times Pennsylvania, Virginia, S. Carolina,



E.N.A.

A NEGRO COTTON-PICKER OF ALABAMA

and Massachusetts attempted to restrict the importation of slaves, but in each case this movement was summarily checked by the Brit. Gov. Thus at the outbreak of the War for Independence there were about 600,000 slaves in the colonies. After they had won their independence, some of the original N. states began to abolish slavery by law, so that by 1804 the institution had disappeared in Massachusetts, Pennsylvania, New Hampshire, Rhode Is., Connecticut, and New York. The ordinance of 1787 kept slavery out of the N.W. There followed the long troubled period in which N. and S. fought each other politically over the question of admission of slaves to the new states and ter., ending in various compromises. The contest ended with the civil war, one of the results of which was that slavery was for ever extirpated in the U.S.A. The 13th amendment to the constitution, adopted in 1865, made this the law of the land. The 14th amendment, ratified in 1868, and the 15th, ratified in 1869, sought to confer full civic rights on the Negro. It was thought by optimists that the results of the civil war had ended the Negro problem. The converse was true, and, indeed, President F. D. Roosevelt

said that the Negroes in the S. were America's problem number one. During the terrible reconstruction period in the S. states, 'carpet-baggers' from the N. (see KU-KLUX-KLAN) led the ex-slaves to the polls, and for a period almost all the S. states were ruled by Negro legislatures made up for the most part of illiterate blacks. With the withdrawal of federal troops, the whites turned the tables and secured control of all the political machinery of the commonwealths. By various state laws the Negroes were practically disfranchised, despite the plain reading of the amendments to the federal constitution. In some states property and educational qualifications were invoked. In others there was the 'grandfather clause' whereby anybody whose ancestors had the vote in 1867 continued to have it. The U.S. Supreme Court has never declared these laws null and void. To this day in the real S. the Negroes are largely disfranchised, although they have the full right of the ballot in the border states like Missouri, Maryland, and Kentucky.

The story of the Negro in the S. is a long one of a humble but determined struggle to rise in the scale. The Negro in the S. does not go to the same schools or churches as do the whites. He has his own churches, and the various states have increasingly given facilities for education. In many of the states there are laws prohibiting the Negroes from travelling in any other than 'Jim Crow cars,' i.e. railway coaches reserved exclusively for Negroes. On the truculents they must sit in the back seats. The Negro is still the main labourer on the big cotton, sugar, and rice plantations, and in 1930 nearly 2,000,000 Negroes were working on the farms; but in the cotton fields more and more jobs the Negroes used to do by hand are now being done by machinery, and a machine has even been invented for picking the cotton. A great many Negroes are 'share-croppers'; that is, they till a little plot of the plantation and share their crops with the owner, paying part of them to him as rent and selling the rest for subsistence money until the next harvest. But they have to buy their seed, tools, and food at the land-owner's store and often at excessive prices, with the result that many are in debt before the next harvest comes round. With their gradual rise as property owners aided by some education, two schools of thought arose among the Negro leaders. Booker T. Washington, head of Tuskegee Institute, was in favour of a slow, but steady rise. According to him the Negro should learn to be a good farmer or a good artisan. He would thus by patience, industry, and usefulness make a better place for himself in the communities of the S. The other school was more impatient and more militant. It advocated fighting for all its rights. The First World War wrought a profound change in the Negro question. The N. as well as the S. was now confronted with it. With immigration into the U.S.A. stopped by the war, the great industrial

plants of the N., working to full capacity, were in serious need of more labourers, and the S. states were canvassed by agents, who induced Negroes by thousands to move N., where there were good jobs, high wages, the vote, and no colour discrimination in the public schools. The Negro pop. of cities like Chicago, Akron, and others was increased to a great extent. New York became the greatest Negro city in the world. In the Harlem dist. of New York city there are about 400,000 Negroes of all classes, from the intelligentsia and the professional classes to the poorest day labourers. Negro industrial workers, numbering more than 1,750,000, were, before the depression of the 1930's, engaged very largely in the steel and building industries, but had more than a proportionate share of their members in the soup lines that were common in the country in 1932; but for very reason all the measures for workers passed and administered by the gov. have been of greater relative benefit to the Negro workers. There are Negro police, shops run by Negroes, and theatres, cinemas, dance-halls, and night-clubs run by Negroes for Negroes. This new condition of things resulted in race riots in Chicago, Washington, and other cities.

But with all the drawbacks, N. and S., with all the dark chapters of lynchings and riots, the Negro race has made marvellous progress since the civil war. To-day there are about 950,000 Negro farmers in the U.S.A. The majority of these are, of course, in the S., Georgia, S. Carolina, and Alabama. The thirst for education among the Negroes has grown immensely. The individual states of the S. have done much to foster this, and wealthy N. people have endowed many schools. In the N. and W. states (where there were, at the last census, 2,750,000 Negroes, or 20 per cent of the pop.) there is practically no separation of schools for Negro and white youth. In the eighteen S. states and the dist. of Columbia the children of 9,500,000 Negroes, or 80 per cent of the pop., attend separate schools, and Negro education for the segregated 80 per cent is decidedly behind white education in every respect. The institutions for Negro education doubled in the decade from 1917 to 1927. To-day there are upwards of eighty colleges for Negroes with endowments of about \$21,000,000. There are more than 50,000 teachers in the Negro schools, and two-thirds of the children of school age are enrolled. Professional schools of medicine and law now exist in the S. states for the training of Negroes. A Negro graduate of the Harvard Law School was recently appointed as a federal judge. Similar striking progress has been made in the churches. The Negro has always been deeply religious, as is evidenced by the lovely Negro spirituals, many of which had their birth in slave days. There are to-day over 42,000 Negro churches, with upwards of 5,250,000 members and property worth \$200,000,000. The Negroes are mainly Baptists, Methodists, and Presbyterians.

Negro Art, Literature, etc.—In the arts, e.g., building, spinning, weaving, pottery, agriculture, the working of metals, the Negroes are moderately advanced, but have probably learnt these under Semitic influence. It is in sculpture, however, that the most important contribution of primitive Negro art was made to art. Negro sculpture exhibits great plastic freedom, showing that the artist was capable of feeling in three dimensions, whereas much European sculpture shows a two-dimensional limitation. On European sculpture of the twentieth century the influence of Negro art has been considerable; the example of Jacob Epstein's work may be cited. For song and dance the Negroes have a natural aptitude, which, especially in America, and emanating thence to Europe, has set the example for much modern syncopated music and for the styles of ballroom dancing in vogue among the white races. Apart, however, from the prevalence of Negro jazz in white civilisation, Negro songs and spirituals have had a lasting popularity, due to the appeal of their simplicity, their dialect, and their naive emotionalism. Negro singers such as Roland Hayes, Marian Anderson, and Paul Robeson have won for the Negro a high place in that art, and their musical ability has also shown itself in gifted compositions. The work of Win. C. Hardy has been carried on by, among others, Wm. Grant Still, whose symphony has been played by great orchestras. Negro painters, sculptors, and architects are not so well known in the world but are none the less significant.

Literature among Afro-American writers is naturally the result of education and of contact with the white races. Their literature is often mystical, or is directed towards the social betterment of the Negroes. Two important Afro-American writers may be mentioned: Phillis Wheatley (1753-84) and Paul Laurence Dunbar (1872-1926). The Negro subject was not overlooked by the white writers, particularly those of the S. Joel Chandler Harris with his 'Uncle Remus' stories virtually made himself the manumensis of the cheery Negro peasant. Thomas Nelson Page in some of his most perfect short stories showed the sentimental attachment between the Virginian gentleman and his old Negro slave or servant. But among the whites in recent years there has been more of a tendency to come to grips with realities. A bold treatment of the Amer. Negro was given dramatically in *The Nigger* by Edward Sheldon (1909), and the one-act plays of Ridgely Torrence (*Granny Maurice*, *The Rider of Dreams*, and *Simon the Cirenean*, 1917) are also concerned with the Negro, while the controversial play, *Green Pastures*, may be mentioned. Among novels, *Porgy*, by du Bois Heyward, gives an 'accurate picture of Negro life in America'. But the most significant development has been the creation of literature by Negroes themselves, fully race-conscious and impatient of the old sentimental and humorous aspects. The danger of this new school is that they may

think more of propaganda than of art. There are realists who objectively try to describe Negro life, and they alone can know it, with full details of dialect, superstition, and religious ecstasy. There are the symbolists, more concerned to express the real racial feeling buried deep in the Negro's soul. These men for the most part eschew dialect. They try to do in literary Eng. what Irish writers have done for their peasant folk. This is best illustrated in the various 'blues' by Langston Hughes and the versified Negro sermons written by James Weldon Johnson. In Claude McKay there is presented the defiant Negro poet who resents the slights and injuries put upon his race. Countee Cullen's *Black Christ*, dealing with a lynching, is famous among Amer. students of Negro poetry. International fame as scientists has come to George W. Carver and Dr. Ernest Everett Just. Dr. Louis T. Wright, the surgical director of Harlem Hospital in New York, is a fellow of the Amer. College of Surgeons.

In France, which country possesses great colonies with Negro pops., interest in Negro literature was stimulated seven years ago by a *Negro Anthology* in which Blaise Cendrars gave Fr. renderings of Negro rhymes and chants which he had collected in Africa. The art of Negro poets in Haiti is not so important because the Fr. influence is too potent.

West African Indigenous Art.—There is an individuality in W. African indigenous art and a genuine tradition that justify its special consideration. The aesthetic aspect of African culture is a discovery of the present generation. Yet the basis of African art, far from being primarily aesthetic, was essentially religious, and its tradition in W. Africa is threatened by the crumbling of the religious and tribal systems under which it grew up. Educational reform, it is hoped by Brit. colonial authorities, may go far to check the evil influence of bad European models on indigenous arts; but it is evident that, if the ritualistic beliefs which dictated the forms of the older carvings are yielding to new conceptions of life and death, form and style will require careful and sympathetic guidance. The monumental heads of Gabun, the bronzes of Benin, the masks of the Portuguese Congo, and the sculpture of the Ivory Coast all prove that in the sphere of art W. Africa is coherent and as a whole has regional unity in its plastic art. There are signs of external influences, as for example in the designs of the state chairs of the tribal chiefs of Ashanti, which betray a European influence, while some carvings in the Fr. Sudan show Nilotic traces; but, generally speaking, W. Africa has made its own characteristic contribution to the artistic creations of the world. But in order to appreciate the mystic beauty of the *chef-d'œuvre* of W. African sculpture we need to realise the worship and awe of those for whom the artist carved his figure. Much that is implicit in the work, the meaning of its symbolism, the ancestral associations of its forms, much of all this is necessarily lost on the European

observer, and indeed, belonging to a passing age, there is danger that soon they will hardly be understood by any but the older African generations. The outstanding achievements in the sculpture include masks for ceremonial use; the long-necked heads from Gabun; a red terra-cotta head called 'Mia' found by Leo Frobenius in Ife, Nigeria; the head of the great fetish Baluba from the Belgian Congo; a fetish head from Man-yema in the Fr. Congo; an antelope's head from the Bambaras country on the Niger; a brass figure of a man with clenched teeth from Dahomey; and the ancestral figure of a woman from Urwa, E. Congo. For photographic reproductions of these see *Arts of West Africa*, ed. by Michael Sadler (pub. for the International Institute of African Languages and Culture by the Oxford Univ. Press, 1935). See also ETHNOLOGY; PHILOLOGY.

See E. B. Tylor, *Anthropology*, 1881; F. L. James, *The Wild Tribes of the Sudan*, 1883; F. G. Ruth, *Negro Education in Virginia*, 1889; A. H. Keane, *Africa*, 1895, 1900, *Ethnology*, 1896, and *Man, Past and Present*, 1900; T. Washington, *The Story of the Negro*, 1910; B. G. Brawley, *Short History of the American Negro*, 1913, 1921; C. H. Wesley, *Negro Labour in the U.S.A.*, 1850-1925, 1927; M. N. Work, *Bibliography of the Negro*, 1928; A. F. Raper, *The Tragedy of Lynching*, 1933; G. Myrdal, *An American Dilemma: the Negro Problem and Modern Democracy*, 1944; A. Rose, *The Negro in America*, 1948; also (novels) Du Bois, *Porgy*, 1934; R. Wright, *12 Million Black Voices*, 1941; and R. Ottley, *Black Odyssey*, 1949. NEGRO ART: R. Fry, *Negro Sculpture and Bushman Painting*, 1920; C. Einstein, *Negerplastik*, 1920, and *Afrikanische Plastik*, 1923; P. Guillaume and T. Munro, *Primitive Negro Sculpture*, 1926; G. Hardy, *L'Art Negre: l'art animaliste des noirs d'Afrique*, 1927; R. S. Rattray, *Religion and Art in Ashanti*, 1927; W. Rothenstein, *The Development of Indigenous Art*, 1929; E. von Sydow, *Handbuch der Westafrikanischen Plastik*, 1930; L. Frobenius and H. Breml, *L'Afrique*, 1930; Nancy Cunava, *Negro Anthology*, 1931-33; J. J. Sweeney, *African Negro Art*, 1935; and L. Frobenius and D. C. Fox, *African Genesis*, 1938.

Negro Lethargy, see SLEEPING SICKNESS.
Negros (formerly *Buglas*), is of the S.W. Visayas group, Philippines, between Cebu (S.E.) and Panay (N.W.), with the active volcano, Mt. Malaspin or Canlaon (*c.* 8200 ft.). The mtn. ridge forms a continuation of Mindanao (Dapitan). Sugar cane, coffee, tobacco, and grain are produced. sugar-sacks, cabon-gro, and abaca manufactured. Bacolod and Dumaguete, caps. of the occidental and oriental provs., are the chief tns. Area 905 sq. m. Pop. 562,000.

Negro Spirituals, Afro-Amer. religious songs, so named in the time of the civil war, though slavery is seldom mentioned in the songs and there is no spirit of vindictiveness in their words. The spirit of the Negro spiritual is informed by a

doctile melancholy, a patient yearning, and a naive confidence in the glory awaiting the singer in the next world. God, Jesus, Satan, and the great figures of the O.T. and the N.T. are dramatised in many N. S. Sometimes marching enters into Negro religious services, coupled with noisy religious exercises—a legacy, it is supposed, of the early Methodist revival meetings of the white masters. From a literary standpoint the words of Negro songs are mostly crude; picturesque and expressive phrases may occur, but their metrical arrangement is primitive, though the singers soon learn how to keep time and rhythm (see, e.g., W. Jekyll, *Jamaica Song and Story*, 1907). As may be inferred from the origin of N. S. no less than from the gay and carefree character of the Negro, the emotional part is out of all proportion to the intellectual in their songs. This no doubt explains why the attempt to replace N. S. by the standard hymns of the white man's churches has, generally speaking, failed, excepting in the N. states and with the more educated and sophisticated congregations of the cities. See also JAZZ; RAGTIME. See P. A. Scholz, *The Oxford Companion to Music*, 1941.

Negus, title of a king or ruler in Abyssinia, the emperor being *N. nagashi* (king of kings). In the last two centuries the rulers of Amhara have claimed it.

Negus, name of a drink consisting of wine (especially port) mixed with hot water, spiced and sugared.

Nehemiah. The book of N. is closely connected with that of Ezra, and in the Jewish canon the two form a single book under the name of Ezra. It tells how N., cup-bearer to Artaxerxes, learnt of the condition of Jerusalem, obtained leave to visit it, and set about its restoration; and of the actions of Ezra in restoring the observance of the law. The whole book is a compilation from various sources made some long time after the events which they narrate. See commentaries by S. Patrick, 1706, and C. F. Keil, 1873.

Nehru, Motilal (1861-1931), Indian Swarajist. Advocate in high court at Allahabad, where he had a magnificent residence; in 1919 he turned his house into a free school which eventually became Congress headquarters. He founded the *Independent*, and presided over Congress, 1919 and 1928, supported non-co-operation and was imprisoned. In 1923 he entered the Legislative Assembly and became president of Swaraj party, 1925. In 1928 he presided over the All Parties Conference at Bombay which produced the N. report recommending dominion status. He endorsed Gandhi's civil disobedience in 1930 and was sentenced to six months' imprisonment.

Nehru, Pandit ('Wise Man') Jarwahrial (b. 1889), Indian Nationalist statesman, b. in Kashmir of Brahman stock, son of Motilal N. (q.v.), a wealthy lawyer. N. had an Irish tutor and, later, was educated at Harrow and Trinity College, Cambridge. He became a barrister of the Inner Temple, practised law at Allahabad, and continued his father's work as a prota-

gonist of Indian nationalism. He became secretary of the Indian Home Rule League in 1918 and, in the same year, a member of the All India Congress Committee, of which body he became general secretary in 1929. He was president of the Indian National Congress, 1929-30. He co-operated with Gandhi and was imprisoned for taking part in the public distilling of salt from sea-water on the shore, thereby violating the unpopular salt monopoly of the gov., and again was imprisoned at various times for civil disobedience activities. He was Congress president in 1936-37. He was strongly anti-Brit.



Press Portrait Bureau

PANDIT NEHRU

as may be gathered from his *Glimpses of World History*, but the achievement of Indian independence in 1947 enabled his naturally W. outlook to come to the fore, and he stands for the Indian partnership, even as a republic, in the Commonwealth. In 1946 he was chosen to be vice-president of the All Indian interim gov. N. yields the greatest influence in India and is hero-worshipped by the masses; even his enemies agree as to his political integrity. He has less of the mysticism of Gandhi and more practical sense. Once won over to Nationalism he converted his father to more extreme methods and the latter gave up his position, fortune, and social contacts with the leading Englishmen in India to follow his crusading son into jail. In 1947 N. became the first Prime Minister of the new dominion of India or Hindustan. His wife, Kamala, died from tuberculosis which she contracted in prison. His sister was the first woman in India to reach ministerial rank, being minister of local government of the United Provs. and India's first delegate to the United Nations Assembly. N. lives at Allahabad, his original mansion becoming the headquarters of the Congress party.

Despite his thirteen years in all in prison and his life of revolutionary agita-

tion, there is no bitterness in his character. His appeal, like that of his great associate Gandhi, is to the affectionate rather than the aggressive side of human nature, though he is both passionate and impulsive and impatient of incompetence and hypocrisy. This note of temperamental impatience has sounded throughout his lifelong agitation against Brit. rule in India, the agitation of a highly educated and highly intellectual man of action chafing at an outworn tutelage. Yet he never emphasised the foreignness of Brit. rule and, in many respects a westerner himself, he did not wish India to go the opposite way from that prescribed by Brit. statesmen, but rather in the same way but under her own impulse. During the Punjab (*a.r.*) massacres of 1947 he threw himself into the most troubled areas with utter disregard of his personal safety, not to incite but to restrain violence. The veneration in which he is held to-day among the millions of India and of Asia beyond India serves to explain why he was the greatest single influence in quelling the riots and stopping the bloodshed. Since then his greatest achievement has been the extraordinary transformation of the atmosphere of India, for there have been no more communal riots. He is to-day the unchallenged ruler of the greatest Asian state and at the same time a W. liberal, a secularist, with an almost Christ-like influence, a lifelong rebel against Brit. rule, and yet Britain's greatest pupil and her friend.

His work, *The Discovery of India* (1947), was written during his years of detention in wartime and much of it is based on knowledge communicated by his fellow detainees. Other pubs.: *Autobiography* (1936), *India and the World* (1936); and *The Unity of India* (collected writings) (1941, 1948). See Anup Singh, *Nehru: the Rising of India*, 1939.

Neile, Richard (1562-1610), archbishop of York, b. at Westminster. Having taken his doctor's degree in divinity in 1600, he became in 1605 dean of Westminster. In 1608 he was made bishop of Rochester and appointed Llandaff his chaplain, and in 1610 was translated to Lichfield, removing to Lincoln, 1614; Durham, 1615; and Winchester, 1628. He sat regularly on the High Commission and in the Star Chamber, and in 1631 was made archbishop of York.

Nilgerry Hills (S. India), see NILGIRI HILLS.

Neilson (Neilson-Terry), Julia (b. 1869), Eng. actress; she studied music with success but abandoned it for the stage, playing Galatea to Lewis Waller's Pygmalion. She married Fred Terry, and appeared generally under Beetham Tree's management, until Terry began management in 1900, after which she appeared with him. Her best-known parts include Ann Page in the *Merry Wives*, Nell Gwynn in *Sweet Nell of Old Drury*, Hester Worsley in *A Woman of no Importance*, Lucy Blakeney in *The Scarlet Pimpernel*, and Rosalind in *As You Like It*. See her memoirs, *This for Remembrance*, 1940.

Neilson, Lilian Adelaide (c. 1848-80), assumed name of an Eng. actress, Elizabeth Ann Brown, also known as Lizzie Bland (Bland being her stepfather's name). She made her début at Margate (1865). Her most celebrated rôle was that of Juliet, and in 1870 she scored a success in London as Amy Robsart in a dramatic version of *Kenilworth*, and also played Rebecca in *Ivanhoe*. She was popular also in America, appearing at Booth's Theatre, New York (1872). See J. W. Marston, *Our Recent Actors*, 1890.

Neilston, tn. in Renfrewshire, Scotland, 10 m. S.W. of Glasgow. Thread manuf. and bleaching are carried on. Pop. 5,000.

Neisse (Polish Nysa), tn. of Poland on the Glatzer N., 30 m. S.W. of Oppeln (Opole). It was formerly the chief tn. of a principality and the residence of a bishop; the episcopal palace is now used for municipal offices. There are manufs. of firearms and machinery. Pop. 38,000.

Neitharath, Mathias, see GRÜNEWALD, MATTHIAS.

Neiva, tn. of Colombia, S. America, cap. of Huila dept., on the right shore of the Magdalena, 75 m. from Girardot and 218 m. from Bogotá. Produces cattle and coffee. Its industries include the manuf. of Panama hats. Pop. 35,000.

Nejd (Majd), country of Arabia, making, with the Hejaz and Asir, the kingdom of Saudi Arabia (q.v. and see also SA'UD, ABDUL ASIZ IBN). The area of N. (i.e. 'the plateau') is about 800,000 sq. m. (including the Nafud and Dahna deserts), and the pop. about 2,275,000, the majority being Muslims of the Wahabite movement. The N. is the general name applied to the central portion of Arabia. Most of its surface is an elevated sandy desert, broken by deep water-courses, which are dry most of the year, and interspersed with many fertile spots. Large numbers of sheep, camels, and horses are reared. Oil has been found in commercial quantities at Dammum (or Dhanran), in Hasa. The climate, despite the great heat, is salubrious. At the close of the eighteenth century the Wahabis conquered the N. tribes and their state still survives in the unified kingdom of Saudi Arabia. The chief tns. of N. are Riyadh, the cap. (pop. 60,000), Hufuf, a trading centre on the Persian Gulf, with a pop. of 30,000, Shagra, Anaisah, Hull, and Burialda, none with a pop. of more than about 20,000. The only ports (Persian Gulf) are Qatif and Uqair, which are suitable only for sailing craft (dhows). Riyadh is notable for its large Wahabite mosque. The people of N. are chiefly Bedouins. The main occupation is pastoral, camels being exported to Egypt, though this trade is much reduced by the development of motor transport; while dates and some cereals are raised for domestic consumption. Other products are hides, wool, oil, clarified butter (ghee), and abas (or Arab cloaks). Dates, hides, and ghee are exported to some extent. The revenue of N. is derived from the customs duty collected in the Hasa prov. and from a tithe on dates and corn. For the hist.

of N. (and the Hejaz) in the First World War see ARABIA.

Nekrasov, or Nekrasoff, Nikolai Alexeievich (or Alexeyevich) (1821-c. 1878), Russian poet and Nihilist. He owned (1847) and conducted the monthly magazine *Sovremennik* (The Contemporary), by means of which Nihilistic opinions were spread among the students of St. Petersburg Univ., and *The Annals of the Fatherland*. In 1840 he pub. *Dreams and Elves*. Other poems are *Peasants' Children; Russian Women; Hero for an Hour; Who can be Happy and Free in Russia?* (1879); and *Last Songs*.

Nellore, or Nellur (ancet. Sinhapur, lion city), cap. of N. dist., Madras, India, on the R. Pennar. In the dist. are mica mines and saltpetre refineries; cotton textiles are manufactured. Pop. (dist.) 1,617,000 (tn.), 56,320.



LORD NELSON

Nelson, Horatio, Viscount Nelson, Duke of Bronte, in Sicily (1758-1805), England's greatest admiral, fifth son of Edmund Nelson, rector of Burnham Thorpe, Norfolk, was b. there Sept. 29. On his father's side he came of a family of clergymen; his grandfather was rector of Hilborough, as his father had been, and two of his brothers were clergymen, one, Wm. N., after Horatio's death at Trafalgar, being gazetted Earl N. of Trafalgar, with remainder to the heirs male successively of his sisters, Mrs. Bolton and Mrs. Matcham. His mother, Catherine Suckling, was grand-daughter of Dr. Maurice Suckling, prebendary of Westminster and rector of Wootton, Norfolk, and grand-nephew of the poet Sir John Suckling. The name Horatio came into the N. family from the Walpoles and Townshends, for though there was no consanguinity, N. was connected by the rites of the church with those historic families. Of N.'s childhood little is known. He himself has written that he was at the grammar school at Norwich and afterwards at N. Walsham, where a brick in the wall covered by glass is still pointed out, marked with the

initials 'H. N.' On Nov. 17, 1770, Capt. Suckling, having been appointed to the command of the 64-gun ship *Raisonnable*, entered his nephew on Jan. 1, 1771, as a midshipman. Soon afterwards he went with his uncle to the *Triumph*, guardship of the Medway, in the rating of 'captain's servant,' this being a recognised practice to secure training as a naval cadet. Early in 1773 he was transferred at his own request to the *Carcass*, which was going on a voyage of discovery in the Arctic, an education of trial and hardship for a boy of fifteen. Later he was rated as a midshipman 'aged 18' (a gross fiction to conceal irregularities) of the *Seahorse*, a frigate which was fitting out for the E. Indies. In this vessel he visited almost every part of the E. Indies, but under the trying climate his health gave way, and on March 14, 1776, the commander ordered him to be discharged to the *Dolphin* for passage to England. N. himself said that the kindness of Capt. Pigot of the *Dolphin* saved his life and indeed he seems to have regained his health as soon as he reached England. Some days later he was appointed Lieutenant of the 64-gun ship *Worcester* by order of Sir James Douglas, commander-in-chief at Portsmouth, and, no doubt, through the interest of Capt. Suckling, who was now comptroller of the navy. Mark Robinson, captain of the *Worcester*, a good and brave officer, treated N. as an equal rather than a very young acting lieutenant, and some few years later in an action off the Chesapeake R. strongly influenced N.'s tactical studies.

Meanwhile, having passed the necessary examination at the Navy Office, he was promoted to be lieutenant of the *Louwestoff*, April 10, 1777, a 32-gun frigate fitting out for the Jamaica station. We are told that at this time he received a letter from his uncle, Suckling, which is significant as showing the low standard of order prevailing in the navy at this time. But this standard hardly applied to the *Louwestoff* which had the good fortune to have for its captain Wm. Locker, who had distinguished himself in the Seven Years war and afterwards joined Hawke's flagship, the *Royal George*; and the valuable lessons Locker had learned from Hawke he now passed on to N. There is no doubt of the great influence he had on N., whom he found avid of knowledge, zealous for the service, and restlessly energetic qualities which won his heart as a sailor and as a man. Probably the great debt which N. owed to Locker and through him to Hawke has only been adequately recognised in later years and could only be recognised by those who realised what manner of man Locker was, a man who in his leisure collected a vast store of information respecting the service, which was later to form the basis of Gharnock's *Biographia Navalis*. In 1778 N. was moved on probation into Sir Peter Parker's flagship *Bristol*, but his probation did not last long and on Dec. 8, 1778, he was promoted to be commander of a brig and, six months later, to be

captain of a Fr. prize re-named *Hinchinbrooke*. In this vessel he led an expedition against Grenada on the extremely unhealthy Lake Nicaragua, but was afterwards prostrated by malaria and apparently near to death when he was recalled to Jamaica by his appointment to the *Janus*, a 44-gun ship (being succeeded on the *Hinchinbrooke* by Collingwood). At Jamaica he lay for some time in the gravest danger, his life being probably preserved by the unremitting care and nursing of Lady Parker. After recuperating for some months in England he was appointed to command the *Ilchester*, a 28-gun frigate. He cruised for many months without any particular success, but gave satisfactory proof of his ability as an officer, and earned the approval of Lord Hood. He was placed on half-pay in 1783, but not long after was appointed to the *Boreas*, and went to the W. Indies, where he captured five Amer. ships engaged in irregular trading, in defiance of the instructions of Sir Richard Hughes. Actions for illegal detention were brought against N., who had, perchance, to remain a prisoner on board his own ship. Eventually an order came out for N. to be defended at the cost of the Crown and so, for the time, his share in the affair might seem to have ended, but for some years afterwards new writs were issued which, though always defended by the Crown, were a source of great annoyance to N.

While on half-pay he took up his residence at St. Omer and, while studying Fr., fell in love with a Miss Andrews, daughter of an Eng. clergyman. His uncle, Wm., brother of Charles Suckling, now deceased, agreed to allow him £100 a year so as to enable him to marry, but his suit was rejected. It is interesting to note that when the *Boreas* sailed from Spithead, Lady Hughes, wife of the commander-in-chief, and her daughter took a passage in her and that N.'s brother Wm. went out as her chaplain. For Lady Hughes N. conceived a strong dislike, considering himself imposed upon in being asked to take her out; he curtly described her as having 'an eternal clack.' Indeed he seems also to have somewhat despised the admiral because 'he bows and scrapes too much for me.' In March 1783 he sailed for St. Kitts, being there for sev. months. Here he fell in love with a young widow, Frances Nisbet, niece of Herbert, president of Nevis, and daughter of Wm. Woodward, a judge of the is. But contrary to the common assumption of a love match, the tone of his letter to Frances suggests esteem rather than passion. They were not married until March 1787. Prince William, who had come out as captain of the *Pegasus*, giving the bride away. In the summer of 1788 N. went to Norfolk and made his home with his father at Burnham Thorpe, where he lived for four and a half years, during which time his applications for employment met with no response beyond a formal acknowledgment, possibly because he was regarded as a man likely to give trouble in time of peace by excess of zeal, as witness the law-suits over the seized Amer.

traders. At this time he was in straitened circumstances, for in addition to his uncle's allowance of £100 a year, he had only his half-pay of £120. It was not until a war with France was threatened in 1793 that he was given the command of the *Agamemnon*, in which in Aug. he conveyed troops to Naples, where he became acquainted with the Eng. minister, Sir Wm. Hamilton, and his beautiful and notorious wife, Emma. In the following year the commander-in-chief, Lord Hood, attacked Corsica, and gave N. the command of the landing party. N. was successful in the operations at Bastia and Calvi, but at the latter engagement lost the sight of one eye. N. gained valuable experience in this, his first real action against the Fr., off Genoa (1795) in which the *Agamemnon* was the Eng. ship most closely engaged. The memory of the action is notable for N.'s criticisms in his letters of Adm. Hotham's conduct of the battle, and posterity may be justified in assuming that had N. been in command most of the Fr. ships would have been captured. He was promoted commodore in 1796, and in the following year, for his share in the victory off Cape St. Vincent, was raised to the rank of rear-admiral.

He had waited eighteen years for his flag rank but was still under forty. Collingwood reached flag rank at fifty, Howe at forty-five, St. Vincent at fifty-three, and Saumarez at forty-four.) In the same year in an engagement he lost his right arm. For his successful attack on the Fr. fleet in Aboukir Bay (1798) he was created Baron N. of the Nile. His attachment to Lady Hamilton was now very strong, and he was at Naples whenever he could possibly be there. Sir Wm. Hamilton proving himself a most complacent husband, though it is to be remembered that he was thirty-five years older than his wife and that N. was but thirty-five. In Lady N.'s letters there is evidence enough of a somewhat colourless womanly affection but not of a thrill of response to the greatness of her husband's daring even when witness herself of the acclamations it called forth; and what N. had never yet found in woman, Lady Hamilton gave him, admiration and appreciation, undisguised and unstinting, and, by the admission of even her unfriendly critics, in giving that admiration she lent reality and grace to the part she was playing. She had, of course, profited by the efforts of Charles Greville, a former lover and nephew of Hamilton, and of Hamilton himself, to educate her in the social accomplishments; she was lovable and had an intense love of admiration, but was unquestionably spoilt by the indulgence of caprice. Yet with all her native coarseness she was born of extremely poor parents in the humblest walk of life — she possessed an intuitive and perfect sense, amounting to genius, for what propriety and good taste demanded in the presentation of an ideal, the true gift of a born actress.

After his return to England in company with the Hamiltons, a return necessitated

by ill health, N. and his wife separated. In 1801 he was promoted vice-admiral, and was in command of the attack on Copenhagen, for his services being raised to the dignity of a viscount. At this famous battle N.'s flagship, the *Elephant*, commanded by Capt. Foley, who had distinguished himself at the battle of the Nile, was in the centre opposite the Dan. commodore Fischer's ship *Dannebrog*. As to the popular incident of the telescopo and N.'s blind eye, it is well confirmed that Sir Hyde Parker, through Otway, his flag-captain, made it clear that the signal to discontinue the action should be understood as permissive and Foley also so understood it. But Col. Stewart (who told the story), who stood beside N. when he lifted his glass, was not aware of the tenor of Otway's message and failed to appreciate that N.'s action and words were jocular. He lived with the Hamiltons in London and at their country house, and after the death of Sir Wm. in 1803 continued his intimacy with the widow. Lady Hamilton told Lord Minto that their relations were platonic. 'Lady Hamilton,' he wrote, 'talked very freely of her situation with Nelson, and of the construction the world may have put upon it; but protested that their attachment had been perfectly pure.' However, she bore him two children, both daughters, but the second d. soon after birth and N. never saw her. N. left it to her to buy the house at Merton, the only home they ever had in England, for he was unable to get leave from the Admiralty even for a few days. All N. stipulated was that everything in the house should be his 'even to a pair of sheets, towels, etc.,' apparently because he wanted to avoid debts. In this manner was conducted the purchase and setting up of his Eng. home, where he spent his happiest hours and from which he set out to fight his last battle. In May 1803 N. was appointed to the command of the Mediterranean fleet, and made the *Victory* his flagship. He lay off Toulon in the hope of the Fr. fleet coming into the open, and so being able to engage it. Napoleon's plan was for the Fr. and Sp. fleets to meet in the W. Indies and there combine into an overwhelming force. Villeneuve, now in command of the Fr. fleet at Toulon, managed to evade N., but a storm drove him back to the shelter of the forts; but later he was able to get away, while N. was delayed at Maddelena by contrary winds. He eventually, on Oct. 21, engaged the allied fleets off Trafalgar, and shortly before the action began hoisted from the flagship the famous signal, 'England expects that every man will do his duty.' The victory was complete and decisive, but when the fate of the action was determined, N. was shot down on his quarter-deck and d. a few hours later. It may be noted here that Adm. Mahan and most authorities state that it had been laid down by N. in his memorandum of Oct. 9, that if the Eng. fleet should be to the windward of the enemy, it would be his object to bring it, in three lines, parallel to and within gunshot of the

enemy, from which position the lee line of ships would bear up all together and attack the enemy's rear, while the weather line and advance squadron threatened the van until such time as it became expedient for them too to bear up and attack the enemy's centre. But the lightness of the wind made it impossible to manœuvre into the requisite position without risking the loss of a whole day and of the opportunity to attack at all. N., however, had no doubt foreseen and discussed the contingency, so that the modification of his plan, which was apparent, was no doubt at once understood by his subordinates. Ideally the Eng. fleet was in two lines perpendicular to the Allies' single line, but in fact the lines on both sides were very irregular, and on the part of the Eng. were rather elongated clusters. This modification of the plan did not, however, affect the essential part of it, and as Mahan writes: 'It is not to the discredit but greatly to the credit of his conception, that it was susceptible of large modification in practice, while retaining its characteristic idea.' On N.'s character it is agreed that at twenty-one he had charm of manner which reflected a kind and generous nature. There is abundant evidence that N. not seldom displayed the self-army of a boy, with all a child's love of praise and a woman's love of flattery, which Lady Hamilton knew how to give. But that he could also act as an officer, judge, and statesman we know from the record of his life and on the evidence of the famous duke of Wellington who once and only once met N., at the Colonial Office in Whitehall. He was of delicate health and diminutive figure, which gave no external hint of his intellectual powers or of the eagerness for glory, or rather honour, which he possessed from his earliest years as a midshipman.

His affection for Lady Hamilton remained unimpaired even in his dying moments. 'Remember, I leave Lady Hamilton and my daughter Honoria as a legacy to my country,' he said, as he lay dying. (As a fact Lady Hamilton and her daughter were left well provided for both by her husband's will and by N.'s but she speedily ran through her £2000 a year.) His last words were: 'Thank God, I have done my duty.' His body was brought home, and, after lying in state at Greenwich, was publicly buried in St. Paul's Cathedral on Jan. 6, 1806. There are many memorials to him, the most notable being the lofty monument in Trafalgar Square, London. He was one of the greatest, if not the greatest, of Brit. naval commanders, and his bravery and skill were beyond all question. The Commons liberally endowed the title, which, as said above, passed to Wm. N., gave £15,000 to each of the sisters, and £200 a year for life to Lady N., upon whom N. had settled £1200 a year when they separated. A N. annuity of £5000 a year was paid by the State from 1806 until 1946, when the gov. introduced a Bill (entitled the Trafalgar Estates Bill) to terminate it on the death of the then

earl or his heir. At the same time the Trafalgar estate was freed from certain statutory restrictions and put in the same position as an ordinary settled estate under the Settled Land Acts. Up to 1946 the State had paid some £700,000 to successive holders of the pecceage since the annuity was instituted in 1806.

Bibliography.—There are many biographies. The most popular was for long that by Robert Southey (1813). The voluminous *Life* by Clarke and McArthur (2 vols., 1808) has been the foundation of most later lives, but should be read with considerable reserve on account of the uncritical attitude of the authors; many of its anecdotes are mere sailors' yarns resting on doubtful authority. Numerous of the anecdotes in common circulation are taken from the *Life* (2 vols., 1806) by Garrison, who wrote it at the instance of Lady Hamilton by way of inflating her alleged claims on the bounty of the gov., and the book has been described as little better than a pack of lies. Capt. A. T. Mahan's *Life of Nelson: the Embodiment of the Sea Power of Great Britain* (2nd ed., 1899), is valuable for its handling of naval technique. The prin. authority for N.'s private life is *The Hamilton-Nelson Papers* (2 vols., 1894), which were privately printed; many of these have been used in J. C. Jeaffreson's *Lady Hamilton and Lord Nelson* (2 vols., 1888), and *The Queen of Naples and Lord Nelson* (2 vols., 1889). The best short life is John Knox Laughton's *Nelson* (1905) which contains an excellent historical background. The prin. authorities for N.'s professional life are his dispatches and letters, which were ed. by Sir Nicholas Harris Nicolas (7 vols., 1844-46); James's *Naval History*; the official correspondence of Admirals Hood, St. Vincent, and others (now in the Public Record Office) and E. Chevalier, *Histoire de la marine française sous le Consulat et l'Empire*, 1886. See also G. A. Stephen, *Horatio, Viscount Nelson*—a catalogue of books, pamphlets, articles, and engravings relating to Nelson in the Norwich Public Library, 1915; C. Wilkinson, *Nelson*, 1931; R. Capes, *Poseidon: a Personal Study of Admiral Lord Nelson*, 1947; the authoritative and excellent life by Carola Oman, 1947; and G. Rawson, *Letters from Lord Nelson*, 1949.

Nelson, Thomas, & Sons Limited, Scottish publishing house founded at Edinburgh in 1798 by Thomas N., son of a Stirlingshire farmer, who first issued eds. of Bunyan and Baxter. The business grew under the direction of his son Thomas, who invented the first rotary printing press. N. also invented a surfaced paper suitable for half-tone blocks. The firm has always specialised in educational and children's books, and their output was greatly increased by the Education Act of 1870. They have also issued cheap eds. of the Eng. classics in various languages. N. is probably the only firm which is directly responsible for every stage in the making of its own books, even growing its own bamboo in Trinidad for pulp, which is converted into paper at the Edinburgh

mills. N.'s earliest premises in Edinburgh at Hope Park, built in 1846, was burned down in 1878 and rebuilt on a larger scale at Parkside. The London premises in Paternoster Row were destroyed in the Ger. raids in Dec. 1940. N. also have houses in Paris and New York. The latter is well known for its issue of the *American Standard Bible*, and loose-leaf encyclopedias of medicine and surgery.

Nelson: 1. Mun. bor. of Lancashire, England, 34 m. N. of Burnley, granted its Charter of Incorporation in 1890. It is one of Lancashire's prin. cotton tns., the home also of iron foundries, brick yards, confectionery manuf., surgical appliances, and other industries. The council owns the water undertaking, covered market, public library, cemetery, public baths, an open air swimming pool in Marsden Park, civic restaurants, sewage and refuse disposal works, and three recreation parks. Pop. 34,500. 2. Prov. dist. of the S. Is. of New Zealand. There are many mineral deposits awaiting development; dolomite, feldspathic clay, cement, marble, and limestone are produced. The prov., particularly the N. portion, is best known for its fruit, tobacco, and hops. Apples are the main crop with pears next, though peaches, plums, cherries, and small fruits, including raspberries, currants, etc., are produced in abundance. In 1948 the apple and pear crop reached 1,250,000 bushels. There is a large canning factory in Nelson city and a modern state fruit-processing plant in Motueka, which is a centre of the fruit industry about 35 m. from Nelson city. Nelson is the only dist. in New Zealand where tobacco is grown commercially, and in 1947 more than 4300 ac. were planted and over 5,000,000 pounds of leaf produced. From the Kent hopfields more than a century ago, early settlers brought hop sets which flourished in the dist., where the industry has continued ever since. It is the only dist. in New Zealand in which hops are grown, and from it the commercial needs of the dominion are supplied. The ann. yield is about 3300 bales. Tomatoes, grown mainly in and around Nelson city, have developed into a major industry which is supplying the markets in many centres throughout the dominion. In 1947 the crop value was about £220,000, 22 ac. being grown under glass. Another big industry is that of timber production. The prov. probably has the largest area of standing native bush in New Zealand. Milling of the timber is extensive but reliance is being placed more and more on exotics. Some 50,000 ac. have been planted, mainly in the state plantation, and there are in addition 25,000 ac. of privately owned plantations. Milling of this timber is proceeding. The cap., Nelson city, up to the date of the abolition of prov. gov., was the seat of the Nelson Prov. Parliament. In 1858, by letters patent, Queen Victoria constituted Nelson a bishop's see and ordained that it be a city. Nelson was founded in 1842 as a centre of the Nelson Settlement under the direction of the New Zealand Company, and was the third of the settlements estab-

by Edward Gibbon Wakefield's famous company. Its institutions include one of the oldest secondary schools in the dominion. Nelson College (for boys) was founded in 1856 and has a roll of over 700 of whom nearly 300 are boarders from other parts of New Zealand and even from abroad. Nelson Girls' College, under the same board of governors, has a roll of over 500 of whom nearly 100 are boarders. Another of Nelson's notable institutions is the Cawthron Institute, which is well known throughout New Zealand and the scientific world for its valuable work on soils, mineral deficiencies, and the control of fungus and insect pests. The institute owes its origin to Thomas Cawthron, an old Nelson resident, who left practically the whole of his fortune, amounting to £210,000, for the promotion of scientific research in its application to the primary industries of New Zealand. In its work the institute has the co-operation of the gov. dept. of scientific and industrial research. Nelson is the chief port of the prov., having a good harbour capable of berthing ships 550 ft. long and drawing up to 22 ft. Area of prov. 10,870 sq. m. Pop. 57,200. Pop. of Nelson city, 18,000. 3. Tn. in the S.E. of Brit. Columbia, Canada. It stands on the W. arm of the Kootenay Lake, and is the chief tn. of the silver-mining dist. of W. Kootenay. The tn. was incorporated in 1897, and has fine schools, churches, etc.; smelting is the chief industry; there are saw-mills, marble and veneer works; granite is quarried and jain is manufactured. Nelson is a tourist resort. Pop. 6000.

Nelsonville: vil. and the centre of a coal-mining dist. in Athens co., Ohio, U.S.A. Pop. 5368.



NELUMBINUM: LOTUS

Nelumbium, species of *Lotus* (q.v.) which grows in Australia and Asia Minor. The flowers are pink and white, and grow on long stems. The fruit, which is edible, is small and grows in clusters. It is sacred to the Chinese and Indians. To the Egyptians it was symbolic of the Nile, and in India it was believed that the whole universe rested on a lotus blossom. It is a symbol of beauty, purity, the sun, and of life.

Nematodes, *Nematoidea*, Threadworms, or Round-worms, order of unsegmented round-worms with a mouth, a swollen gutlet, and a digestive canal running the whole length of the body. They vary in size from *Eustrongylus gigas*, of which the female exceeds a yard in length, to the very minute *Heteroderes*, parasitic on plants and less than $\frac{1}{2}$ of an inch. In some N., notably the Strongyle, which causes 'poxes' in chickens, the male is attached to the female, the whole resembling in form the letter Y. A large proportion of N. are parasitic in animals, including man. *Trichina spiralis* enters the human system from badly cooked pork, and millions of the worms of this species have been found in the body of a man. Many N. are the causes of very heavy losses amongst domesticated animals. Apart from intestinal N., one of the most serious parasites is *Strongylus micrurus*, which causes verminous bronchitis ('husk' or 'hoose') in calves that are put out during the autumn months on wet pastures. This and many other parasitic worms are checked or eradicated by the presence of salt in the soil. One of the most serious plant parasites is *Heterodera radicicola*, which causes root knot disease in tomatoes and cucumbers. *Ascaris lumbricoides* is a common parasite in pigs and man. See also ANKYLOSTOMIASIS; ASCARIS; FILARIASIS; PARASITES; TRICHOSTOSIS. See W. Yorke and P. A. Maplestone, *The Nematode Parasites of Vertebrates*, 1926, and B. G. and M. B. Chitwood, *An Introduction to Nematology*, 1937.

Nematus, see SAW-FLIES.

Nemea, anct. name of the valley of Argolis, between Cleone and Phlius in the Peloponnesus. In it were celebrated every two years the Nemean games of which Pindar sang in his *Nemean Odes*. According to Gk. mythology, Hercules slew the Nemean lion there. The valley contained a sacred grove and a temple to Zeus.

Nemean Games, one of the four great national festivals of the Gks., held at the beginning of the second and fourth year of each Olympiad at Nemea in Argolis. There were the usual athletic contests, horse-racing, and a competition for players of the cithara; palm branches and crowns of parsley were bestowed on the victors. They were celebrated under the presidency of Cleone, Argos, and Corinth in turn. Many of the victors of the N. G. have been immortalised in the Nemean Odes of Pindar. See E. N. Gardiner, *Greek Athletic Sports and Festivals*, 1910.

Nemecky-Brod, or **Deutschbrot**, tn. of Czechoslovakia and the cap. of the dist. of that name. It is situated on the R. Sazava, 60 m. S.E. of Prague. The manufs. are cloths, machinery, and glass. Pop. 9000.

Nemertea, subdivision of unsegmented worms allied to, and by some authorities arranged among, Platyhelminthes, the flat-worms. They are long, ribbon-shaped animals. Most of them are marine, but a few occur in fresh water and a few also on land. It is doubtful whether any are true parasites.

Nemesianus, *Marcus Aurelius Olympius* (fl. c. A.D. 280), Rom. poet, b. in Carthage. He wrote poems on hunting, *De Venatione* and *Cynegetica*; on fishing, *Halieutica*; and on aquatics, *Nautica*. See E. Bahrens, *Poetae Latini Minores* (vol. iii.), 1881.

Nemesis (Gk. Νέμεσις, distribution, retribution), in anct. Gk. mythology the daughter of Night, and goddess of vengeance and chastisement. She personifies the indignation felt at all disturbance of proportion, punishes arrogance or boastfulness (*hybris*) accompanying extraordinarily good fortune, and brings things once more within normal bounds. She was also called Adrastela, 'she whom none can escape.'

Nemesius (fl. c. A.D. 390), Christian philosopher, was bishop of Emesa in Syria. Very little is known about the facts and dates of his life. He is chiefly remembered as the author of *Περὶ φύσεως ἀνθρώπου* (On Human Nature), a treatise on anthropology from the Christian standpoint. It was first ed. by Valla (1538), and was trans. into Eng. by George Wither (1636). See Bender, *Untersuch. über Nemesius*, 1898.

Nemetodorum, see NANTERRE.

Nemophila, genus of hardy annuals (order Hydrophyllaceae) with blue or white flowers and pinnatifid leaves. *N. insignis* is a brilliant blue with a white centre or eye.

Nemours, Louis Charles Philippe Raphael d'Orléans, Due de (1811-96), second son of King Louis Philippe. The title of due de N. was first borne by the Armagnac family, and was revived in Louis Philippe. He was offered, but refused, the throne of Greece (1825) and of Belgium (1831). He fought in the Algerian expedition (1836-1841), and after the revolution of 1848 fled in England till 1870. See R. Bazin, *Le Due de Nemours*, 1907.

Nemours, tn. in the dept. of Seine-et-Marne, France, 10 m. S. of Fontainebleau. There is a sixteenth-century church and a castle. Pop. 5000.

Nemptodorum, see NANTERRE.

Nen, or **Nene**, riv. rising in the W. of Northamptonshire, England, and flowing past Northampton and Peterborough into the Wash. Length 90 m. The N. is connected with all the central waterways of England by canal.

Neuagh, mkt. tn. of co. Tipperary, Eire, 11 m. E.N.E. of Killaloe. It has slate quarries and the remains of a Norman keep, called N. Round. Pop. 4517.

Nennius, historian (fl. 796), the traditional author of the *Historia Britonum*, of which there are sev. versions; the chief MSS. are the Cambridge, the Vatican, and the Harleian. He lived on the borders of Mercia, and was a pupil of Elbod, bishop of Bangor. The book commences with a fabulous account of the colonisation of the is. Its chronological blunders and the many other proofs of its want of authenticity render it a very unsafe historical authority. It is chiefly valuable for its stories of King Arthur, Merlin, and other heroes.

Nennius, Saint (fl. sixth century), Irish abbot, one of the 'Twelve Apostles of Ireland.' The details of his life are

unknown, except that he was a disciple of St. Finnian of Clonard.

Neocastro, see NAVARINO.

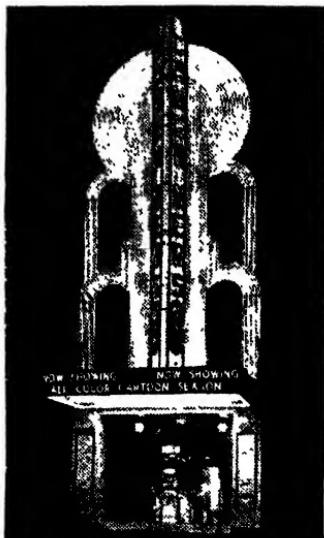
Neodymium, metallic element, symbol Nd, atomic number 60, atomic weight 144.3. Didymia is one of the oxides known as the gadolinite earths; it was formerly supposed to be the oxide of a metal didymium. Didymium was, however, split up into two components, N. and praseodymium, in 1885. The former gives rise to pink salts and the latter to green.

Neo-Kantianism, or **Neo-Kantism**, is the philosophy of Kant (*q.v.*) as taught and interpreted by his successors. Notable among these in modern times are Meyer-son, Helmholtz, Riehl, and Hermann-Cohen. Meyerson approaches philosophy from the direction of natural science, whose aim, he holds, is the discovery of rationality in things, that is, the reduction of differences to an identity which absorbs them all. His work, which may be termed a theory of knowledge, is supported by Einstein, and may briefly be described as a belief in the uniformity of nature and its response to speculative inquiry. Helmholtz, with whom may be mentioned Hammequin, declares that the principle of causality is nothing else than the supposition that all phenomena of nature are subject to law, that the cause of a phenomenon is therefore the law, though he later modified the somewhat dogmatic statement by an acknowledgment that he has followed Kant too closely, maintaining finally that the principle of causality was only a hypothesis of the reign of law in all phenomena. See his treatise, *Über die Ehrallung der Kraft* (1847). Colding, the Dan. physicist, a year after Meyerson's first treatise, brought forward an independent proof of the axiom of the conservation of energy and confirmed it experimentally; he also assumed it to be a law of reason. It is in connection with present-day ventures into psychological study that a revival of interest in Kant's theories has most extensively occurred; and in the confusion which many thinkers to-day experience between psychology and theory of knowledge, Kant's clear doctrines propounded in his *Critique of Pure Reason* serve to dispel the difficulty of demarcation. He definitely stated that the *Critique of Pure Reason* was not to be regarded as an inquiry into psychological phenomena, but rather as a study of the criticism and possibilities of experience. See H. Helmholtz, *Wissenschaftliche Abhandlungen*, 1882, and *Verträge*, 1896; L. Rougier, *Philosophy and the New Physics*, 1922; H. Höffding, *History of Modern Philosophy*, 1921; E. Meyerson, *Identity and Reality*, 1930.

Neolithic, see STONE AGE.

Neon, chemical element, symbol Ne, atomic number 10, atomic weight 20.2. N. is one of the constituents of the atmosphere, of which it forms about 1 part in 100,000 by volume. It was discovered in 1898 by Sir W. Ramsay and Prof. M. W. Travers. N. is used in gas-filled electric lamps, and for advertisement purposes in electric discharge tubes, in which a variety of shapes and colours is possible. N.

discharge tubes are also used in aerodrome beacons, because of the fog-penetrating powers of the light they produce. Chemically N. is completely inert; it forms a member of the group of inactive gases.



Cladoux

NEON LIGHTING

An installation in which 3000 ft. of tubing are employed. The vertical name sign is in 2-ft. letters illuminated by ruby red tubing.

Neophyte (Lat., *neophytus*, from Gk. *neobios*, newly planted), name given by the primitive Church to the new Christians, that is, to the pagans who had newly embraced Christianity and had been baptised. The term is still used by Rom. Catholic missionaries to denote a convert from heathenism. In general language, newly entered upon, e.g. Ben Jonson's 'neophyte player.'

Neoplatonists, name given to an illustrious succession of ancient philosophers who claimed to found their doctrines and speculations on those of Plato. It is not easy to say with whom Neoplatonism commenced. Scholars differ as to how much should be included under that term. By some it is used to designate the whole new intellectual movement proceeding from Alexandria, comprising, in this broad view, the philosophy, first, of Philo Judaeus and of Numenius the Syrian; second, of the Christian Fathers (Clemens Alexandrinus, Origen, etc.); third, of the Gnostics; and fourth, of Ammonius Saccus and his successors. Others, again, would exclude the second of these (though the Alexandrian divines frequently Platonise), while a third party is disposed to restrict the application of the term to the fourth. The last of these modes of regarding Neo-

platonism is the one most current. A fresh stream of life was first poured into the old channels of Platonic speculation by Ammonius Saccas and Plotinus, and it is this fact which gives the school which they establish its best claim to the exclusive title of *Neoplatonist*. The essence of all the Alexandrian speculations consists in the blending of Platonic ideas with oriental mysticism; the peculiarity of the N., strictly so called, lies simply in the novelty, audacity, and ingenuity of their reasonings. They aimed at constructing a religion on a basis of dialectics. They strove to attain a knowledge of the Highest by assuming the existence of a capacity in man for passing beyond the limits of his personality and acquiring an intuitive knowledge of the absolute, the true—that which is beyond and above the fluctuations and dubieties of ‘opinion’. This impersonal faculty is called *Ectasy*. Plotinus, in fact, set out from the belief that ‘philosophy’ (*i.e.*, ‘Absolute Truth’) is possible only through the identity of the thinker, or rather of the subjective thought, with the thing thought of, or the objective thought. The God of Plotinus and the other Alexandrians is a mystical Trinity. The Divine Nature contains within it three Hypostases (Substances); its basis, if we may so speak, is called Unity, also poetically Primitive Light. From ‘Unity,’ as the primordial source of all things, emanates ‘Pure Intelligence’ (*Nous*); its reflection and image, that by which it is intuitively apprehended; from Pure Intelligence, in turn, emanates the ‘Soul of the World’ (*Psyche tou pantos*), whose creative activity produces the souls of men and animals and ‘Nature’; and finally, from Nature proceeds ‘Matter,’ which, however, is subjected by Plotinus to such refinement of definition that it loses all its grossness. Unity, Pure Intelligence, and the World-Soul thus constitute the Plotinian Triad. Other Neoplatonists were Porphyrius, Iamblichus, Adeodatus, and Proclus.

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Neoprene, form of synthetic rubber produced in America, the first to be commercially successful. It is obtained from butyl chloride, and may be vulcanised with zinc oxide.

Neoptolemus, in anet. Gk. legend, the son of Achilles and Deidamia, also called Pyrrhus. At the death of his father he was taken by Ulysses to Troy, and was one of the Gk. heroes who entered Troy in the wooden horse. At the fall of Troy he slew the aged Priam. On the distribution of captives Andromache, widow of Hector, was given to N. Ultimately he wedded Hermione, daughter of Menelaus, who had been previously betrothed to Orestes, and was slain by the latter.

Neosho: 1. Co. seat of Newton co., Missouri, U.S.A., in the centre of a zinc and lead-mining dist. Pop. 5300. 2. Riv. rising in Morris co., Kansas, U.S.A., and flowing through Indian ter. into the Arkansas R., near Fort Gibson. Length 400 m.

Neottia, Nidus-Avis, see ORCHIDS.

N.E.P., Russian contraction for Novaya Ekonomicheskaya Politika (New Economic Policy), the policy adopted by the Soviet Union following the civil war, in 1922, with a view to promoting the recovery of production and trade. It admitted a certain amount of private initiative and profit; private enterprise, domestic and foreign, was encouraged in commerce and in minor industries. The N.E.P. was liquidated in 1927 and succeeded by strictly Socialist five-year plan policy. See further under RUSSIA, Economic System and History.

Nepal, independent native kingdom on the N.E. frontier India, comprises a portion of the S. slope of the Himalayas; it is bounded on the N. by Tibet, on the S. and W. by the United Provs. and Bihar, India, and on the E. by Sikkim and Bengal. The state is separated from the plains of India by the long, narrow strip of land, resembling an Eng. down, but unhealthy, called the Terai, which extends along the whole S. border. N. of this, and running parallel with it, is the great forest of Nepal, from 8 to 10 m. broad, abounding in wild animals. Still further N. is a tract of hilly country, and above that are two tracts of greater elevation, which include among their peaks Mt. Everest (29,141 ft.), Dhaulagiri (26,286 ft.), and Makalu (27,800 ft.). The prin. rvs. are the Kurnali, the Rapti, the Gunduk with its great trib., and the Sun Kosi. The climate, most unhealthy in the Terai, is healthy and pleasant in the hilly and mountainous dists., suggesting that of S. Europe. The soil is extremely rich and fruitful. Barley, millet, rice, maize, wheat, cotton, tobacco, sugar-cane, pineapple, vegetables, and various tropical fruits are cultivated in the higher areas, whilst rhododendrons flourish between 8000 and 9000 ft. Gold, silver, lead, iron and copper mines are worked. Exports include cattle, hides, opium and other drugs, jute, dyes, rice, ghee (clarified butter), oil-seeds, spices, saltpetre, and timber. The Gbirkas (Turkhias or Nepalese) are divided into numerous tribes, the largest being Magars, Gurungs, Newars, and Bhutias (Bhotias), the aboriginal stock being Mongolian. Hinduism is the predominant religion. Since the treaty of Sagauli (1815) Brit. relations with Nepal have been friendly. Hostilities between Nepal and Tibet broke out in 1854 and ended in a treaty in 1856 under which Tibet paid an ann. tribute and promoted trade relations with Nepal. The cap. is Khatmandu (q.v.) (pop. 108,800). The state is administered by the maharajah and his Prime Minister, and there is a vlt. president at the cap. A new treaty of friendship was signed in 1923, but the policy of seclusion is still consistently adhered to by Nepalese rulers. The real political power rests

with the Prime Minister, who is always a member of the ruling family (Hindu Rajputs). In 1934 the status of the Brit. representative was raised to minister plenipotentiary and a Nepalese representative of equivalent rank was accredited to London. In the First and Second World Wars Nepal gave unstinted aid to the Brit. Gov. in men, money, and material. Since 1920 the gov. has constructed a good carriage road from Amlekhgung to Bhimphedi, and a railway was opened in 1927, connecting Amlekhgung with the Brit. and N.W. Railway at Raxaul (25 m.). Nepal is of great archaeological interest, being connected with the life of Buddha. Area 51,000 sq. m. Pop. 6,282,000. See Col. W. Kirkpatrick, *Account of the Kingdom of Nepal*, 1811; W. Hamilton, *In Account of the Kingdom of Nepal*, 1819; B. Hodgson, *Essays on the Languages, Literature, and Religion of Nepal and Tibet*, 1874; Sir H. B. Edwards, *Life of Sir Henry Lawrence* (Brit. resident at Nepal), 1875; *History of Nepal* (trans. by Wright), 1877; H. A. Oldfield, *Sketches from Nepal*, 1880; C. Bendall, *A Journey in Nepal and Northern India*, 1886; P. Brown, *Picturesque Nepal*, 1912; P. Landon, *Nepal*, 1928; W. B. Northey, *The Gurkhas: Manners and Customs*, 1928, and *The Land of the Gurkhas*, 1937; H. Davis, *Nepal, Land of Mystery*, 1942; and S. Cutting, *The Fire Ox and Other Years*, 1947.

Nepenthes, genus—the only one of the order Nepenthaceae—of remarkable shrubby plants with small green or brown flowers, borne in long racemes, and with leaves dilated at the ends into pitcher-shaped appendages with a lid-like lamina. The broad, strap-shaped portion of the plant, which resembles a leaf blade, is the wing petiole or leaf-stalk. The size of the pitcher varies from that of a thimble to about 20 in. in length, with a capacity of about two quarts. The pitchers act as traps for insects and larger animals, attracted both by the bright colours of the pitchers and by a honey-like secretion round the entrance. Their function is to provide nitrogenous food for the plant. About thirty species are known, mostly natives of tropical Asia and the Malay Is. The culture of *N.* is easy if abundance of moisture and a tropical temp. can be provided. The pitchers must be kept partly full of water. The roots should be set in well-drained baskets containing peat fibre and sphagnum.

Nepheline, rock-forming mineral whose formula is $\text{Na}_2\text{K}_2\text{Al}_4\text{Si}_4\text{O}_{14}$. Its crystals are transparent, have a hardness of 5½, and sp. gr. 2.6. Two varieties of the mineral are found: glassy *N.*, in small, transparent crystals occurring in late volcanic rocks, and cleoelite, large crystals or massive with varying colours owing to the presence of other minerals. When of a good colour, examples of cleoelite are cut as gems.

Nepheline Syenite, rock of plutonic origin containing essentially alkali-felspars and nepheline, together with other accessory minerals. The nepheline often

assumes the form of cleoelite. The felspar is often rich in both soda and potash, whilst the cleoelite is often found in large colourless crystals. Sodalite often accompanies it. The only important *N. S.* found in Great Britain occurs in parts of Sutherland. It contains nepheline, felspar, and smaller amounts of green biotite, as well as some black garnet. A second type of *N. S.* is to be found in the S. of Norway. It gives rise to the Lardal type, in which nepheline, alkali felspars, brown mica, augite or argorite, apatite, and sometimes olivine are present. Other localities where *N. S.* is found are Portugal, Arkansas, Brazil, Montreal, etc.

Nephelum, genus of Sapindaceae. They have generally pinnate leaves, flowers in panicles, and round or ovate warty or prickly fruit. *N. litchi* is the Litchi; *N. longanum*, the Longan; and *N. lappaceum*, the Rambutan.

Nephrite, also known as Jade (q.v.) or Axestone, is a hard mineral (hardness 7 and sp. gr. 3), massive, compact, very tough, and without any cleavage. In colour it varies from white to bluish green, and may be blotched or veined. It is sometimes translucent, and is greasy to the touch. In composition it is a silicate of magnesia and lime, although some alumina and oxide of iron are often present. The composition is very variable, and some mineralogists regard it as a massive form of tremolite. It is found in granite, gneiss, greenstone, etc. It was confused with Jadeito until Damour (1863) showed that jadeite was silicate of alumina and lithium, which is fusible, whereas *N.* is infusible. *N.* takes a beautiful polish, and is highly prized for ornaments, especially the bright green varieties. The Turks made it into handles for sabres. Many imaginary virtues have been ascribed to it. Thus people once wore it as a charm against epileptic fits and nephritic (Gk. *νέφρος*, the kidneys) complaints; hence its name. The prin. sources of the mineral at the present day are New Zealand, China, N.W. America, Corsica, and Egypt.

Nephritis, inflammation of the kidneys. There are many forms of kidney inflammation, due to a wide variety of causes. In most cases poisonous substances are brought to the kidney by the blood-stream, so that kidney disease is a frequent complication of such diseases as gout, typhoid and scarlet fevers, tuberculosis, etc. In chronic interstitial *N.* or granular kidney, the muscular coat undergoes fibroid and hypertrophic changes, and becomes uneven in surface. There is a marked increase of connective tissue about the tubules and glomerules. The symptoms, as of *N.* generally, are anaemia, weakness, digestive disturbances, and bloody urine. Acute Bright's disease is characterised by enlarged and congested kidneys. Many tubules contain casts, and these are thrown off in the urine, giving a characteristic indication. The symptoms are fever, lumbar pains, dropsy with albumin, blood, epithelial cells, and casts in the urine. See also under *Horse Diseases*.

Nephrodium, *see* MALE FERN.

Nepigon Lake, *see* NIPIGON.

Nepomuk, or Pomuk, John of, patron saint of Bohemia, *see* JOHN, ST.

Nepos, Cornelius, contemporary and friend of Cicero, Atticus, and Catullus. N. wrote historical works, and there is extant under his name a work entitled *Vita excellentium imperialium*. But in all MSS. this work is ascribed to *Emilius Probus*, with the exception of the lives of Atticus and Cato the Censor, which are attributed to N. It is probable that Probus abridged the work of N., and that the biographies, as they now exist, are epitomes of lives actually written by N.

Nepos, Flavius Julius (d. 480), last but one of the emperors of the W. b. in Dalmatia. He was the nephew of Marcellinus and the son-in-law of Leo I., emperor of the E., who proclaimed N. emperor of the W. in 474. He crushed his rival Glycerius and made peace with the Visigoths by ceding to them the Gallic prov. of Auvergne. He was driven out of Italy by Orestes, but retained his power in Dalmatia until his murder in 480 at Salona.

Neptune, *see* POSEIDON.

Neptune. The discovery of N. is the most triumphant record of mathematical astronomy. Adams of Cambridge (1845) and Leverrier of Paris (1846) both determined its position from no other data than certain perturbations of Uranus. Galle, instructed by Leverrier, found the planet on Sept. 23 1846, within half an hour. The magnitude lies between 8 and 9, and it is invisible to the naked eye, though visible through a good opera glass as a greenish disk; apparent at mean opposition diameter, 2·52, real diameter, 33,000 m., but uncertain; vol., seventy-two times that of the earth, its mass seventeen times; density, 0·24. The mean distance does not follow Bode's law, being 2,796,600,000 m. from the sun; the orbit has an eccentricity of 0·0086, the least with the exception of Venus, making a difference of solar distance of 48,000,000 m. Inclination of orbit, 18°; revolution completed in 164 years at a velocity of about 3½ m. per sec., rotation not yet determined, though probably 16 hrs. The spectrum, the light being feeble, is difficult to determine, and indicates the presence of a dense atmosphere similar to that of Uranus; a dark band in the red was identified in 1932 by Dunham as due to methane. Satellites: (1) Triton, discovered by Lassell in 1846; distance 223,000 m.; period 5 days 21 hrs. 2·7 min.; orbital inclination, 34° 53'; moving backwards like those of Uranus. (2) Nereid, discovered May 1, 1949, by Kuiper at the McDonald Observatory, Fort Davis, Texas. Distance from N. 5,000,000 m.; diameter 200 m.; period about 2 years; moving backwards close to plane of ecliptic.

Nerbudda, *see* NARRADA.

Nerchinsk, or Nertchinsk, tn. in the Chita Region of the R.S.F.S.R. on the Nercha R., 135 m. E. of Chita. Pop. 10,000.

Nerchinski Zavod, tn. and mining dist. in the Chita Region of the R.S.F.S.R.,

184 m. S.E. of Nerchinsk. It has a meteorological observatory and is the centre of a mining area. Pop. 3000.

Nereids, in Gk. mythology, the nymphs of the sea, the daughters of Nereus and Doris. The most famous of them were Amphitrite, the wife of Poseidon, Thetis, the mother of Achilles, and Galatea. The N. were the marine nymphs of the Mediterranean, in contradistinction to the Naiads, the nymphs of fresh water, and the Oceanides, the nymphs of the great ocean. See also Nymphs.

Neretva (formerly Naro, or Narenta), one of the few considerable rvs. flowing into the Adriatic. It belongs mainly to Herzegovina, which state is wholly bisected by the riv. The valley of the N. and its trib., forms the main artery of the state. Mostar (q.v.) is situated on it. A good highway follows the riv. bank from the Dalmatian frontier to the Bosnian. The riv. discharges between the peninsula of Sabioncello and the mainland and forms a large marsh.

Nereus, in Gk. mythology, a god of the sea, the son of Pontus and Gaea. He married the Oceanide, Doris, by whom he became father of the Nereids. He had the gift of prophecy and the power to change his form at will. He is generally represented as a calm and gentle old man bearing a trident.

Nergal, Assyrian god of hunting, was also identified with the planet Mars. This god was represented in sculpture as a winged lion with a human head.

Neri, Philip (1515-95), saint of the Rom. Catholic Church, b. in Florence. In 1550, with sev. of his friends, he estab. a confraternity for the care of poor pilgrims visiting Rome, as well as of the sick generally, which has numbered among its associates many of the most distinguished members of the Rom. Catholic Church. This confraternity was the germ of the more celebrated Congregation of the Oratory, which was founded by St. Philip in concert with his friends Baronius and Tarugio, both afterwards cardinals, Sabriati, and some others. The main object of this association was the moral instruction and religious training of the young and uneducated. Sacred musical entertainments (thence called by the name of *oratorio*) were held in the oratory. He was canonised by Gregory XV. in 1622. His best-known church in Britain is that at Arundel, Sussex, completed in 1876 in early Gothic style by the fifteenth duke of Norfolk. See life by P. J. Bacci, 1822 (Eng. trans., 1902); and L. Pennelle and L. Bordet, *Saint Philip Neri and the Roman Society*, Eng. trans. 1932.

Neris-les-Bains, *see* MONTLUCON.

Nero (A.D. 37-68), Rom. emperor, b. at Antium, the son of Cn. Domitius Ahenobarbus and of Agrippina, the daughter of Germanicus Caesar. His mother becoming the wife of the Emperor Claudius, Claudius adopted him (A.D. 50), and his name, originally L. Domitius Ahenobarbus, was changed to N. Claudius Caesar Drusus Germanicus. After the death of Claudius (A.D. 54) the Praetorian Guards, at the instigation of Afranius Burrhus, their

prefect, declared him emperor, instead of Claudius's son Britannicus. His reign began with the semblance of moderation and good promise, under the guidance of Burrhus and his tutor Seneca the philosopher; but the baseful influence of his mother, together with his own moral weakness and sensuality, frustrated their efforts, and he soon plunged headlong into debauchery, extravagance, and tyranny. He caused Britannicus, the son of Claudius, to be treacherously poisoned at the age of fourteen, and afterwards (A.D. 59) caused his own mother, Agrippina, to be assassinated, to please his



NERO
Vatican, Rome

mistress, Poppaea Sabina (the wife of his first boon-companion, Otho, afterwards emperor), in order to marry whom he also divorced and afterwards put to death his wife Octavia, the sister of Britannicus. The low scurrility into which the Rom. senate had sunk at this time may be estimated from the fact that it actually issued an address congratulating the baseful matricide on the death of Agrippina. The affairs of the empire were at this time far from tranquil. In A.D. 61 an insurrection broke out in Britain under Queen Boadicea, which was, however, suppressed by Suetonius Paulinus. At home matters were not much better. The emperor was lampooned in verse; the senate and priesthood, alike venal, were also satirised by audacious malcontents; Burrhus, a valuable friend, d.; and even Seneca, though not a great moralist, out of his books, thought it only decent to remove from court. In July 64 occurred a great conflagration in Rome, by which two-thirds of the city was reduced to ashes. N. himself is usually believed to have been the incendiary. It is said that he admired the spectacle from a distance reciting verses about the burning of Troy, but many scholars doubt whether he

really had any hand in it. At all events, he laid the blame on the Christians, and persecuted them with great fury. He rebuilt the city with great magnificence, and reared for himself on the Palatine Hill a splendid palace, called, from the immense profusion of its golden ornaments, the *Aurea Domus*; and in order to provide for this expenditure, and for the gratification of the Rom. populace by spectacles and distributions of corn, Italy and the provs. were unspareingly plundered. A conspiracy against him failed in the year 65, and Seneca and the poet Lucan fell victims to his vengeance. In a fit of passion he murdered his wife Poppaea by kicking her when she was pregnant. He then proposed to Antonia, the daughter of Claudius, but was refused, whereupon he caused the too fastidious lady to be put to death, and married Statilia Messalina, after killing her husband. His vanity led him to seek distinction as a poet, a philosopher, an actor, a musician, and a charioteer, and he received sycophantic applause, not only in Italy, but in Greece, to which, upon invitation of the Gk. cities, he made a visit in 67. But in 68 the Gallic and Sp. legions, and after them the Praetorian Guards, rose against him to make Galba emperor, and N. fled from Rome to the house of a freedman, Phion, about 4 m. distant. The senate, which had hitherto been most subservient, declared him an enemy of his country, and the tyrant ended his life by suicide on June 9, 68. See G. Ferrero, *Characters and Events of Roman History* (ch. iv.), 1909; and lives by B. W. Henderson, 1903; A. Weigall, 1930; and G. Wurtenberg, 1947.

Nero, Gnaeus Claudius, Rom. general who was consul in 207 B.C. In that year he intercepted Hasdrubal, who was crossing from Spadu to Italy with reinforcements for Hannibal, and severely defeated him at the battle of the Metaurus. Over 50,000 Carthaginians perished, and amongst them Hasdrubal himself. N. was censor secy. years later.

Nero, Tiberius Claudius, Rom. soldier, served as questor under Cesar in 47 B.C., was on the side of Brutus after the latter's death, but was later reconciled to Octavians. He is principally known as the husband of Livia Drusilla, and father of her two sons Drusus and Tiberius, the latter of whom became emperor. In 38 Octavias divorced his wife, Serpentina, and married Livia, who had obtained a divorce from N.

Neroli, Oil of, see ORANGE.

Nertchinsk, see NERCHINSK.

Nerthus, see HERTHA.

Neruda, Madame, see HALLE, LADY.

Nerva, Marcus Cocceius (c. A.D. 35-98), Rom. emperor for scarcely two years. He had previously served the Rom. state as praetor, then as consul. He was appointed emperor upon the death of Domitian in 96, but his honours sat heavily on him, and he gladly resigned jointly with Trajan until his death.

Nerval, Gérard de (1808-55), adopted name of Gérard Labrunie, a Fr. man of letters. In 1828 he pub. a trans. of

Goethe's *Faust*, and later on he collaborated with Théophile Gautier. He was a great traveller, and narrated his adventures in the *Revue des deux mondes*. His most interesting literary contribution is his *Aurèle, ou le rêve et la vie* (1855), a record of his own insanity, and perhaps his best work is his collection of stories, *Contes et facéties* (1852). See R. Bizet, *La Double Vie de Gérard de Nerval*, 1928, and K. Haedens, *Gérard de Nerval, ou la sagesse romantique*, 1939.

Nerves, see NERVOUS SYSTEM.

Nervi, tn. and seaside resort in the prov. of Genoa, Italy, 6 m. S.E. of Genoa. Pop. 9000.

Nervous System, that part of the mechanism of the body whose special function is the co-ordination and control of the activities of the organs. The system is composed of nerve-cells or neurons, which are linked together and capable of sending impulses from one to the other. In other words, the nerve-cell has a life or metabolic existence of its own, which is modified in a particular manner by certain stimuli received from outside itself, and which modifies the metabolism of an adjacent nerve-cell or certain other cells, such as those of muscle. In this way impulses are conveyed from the exterior to centres throughout the body, and from such centres to other centres or to other tissues. The effects of what may be called nerve-currents are divisible into three classes: those changes which involve movements in certain structures, as the contraction of a muscle; those changes which involve modifications in consciousness, as a special or general sensation; and those changes which are merely chemical, that is, which stimulate the production of certain substances, as in the various secretory organs. The different nerves are responsive to different stimuli, and each nerve transmits its impulse in one direction only. The latter property has given rise to the distinction between efferent and afferent nerves: those that conduct impulses outwards from a nervous centre, and those that conduct impulses towards the centre. The chief kinds of efferent nerves are: (1) Motor nerves, which convey currents to voluntary or involuntary muscles and excite them to contract; (2) accelerator nerves, which produce an increase in the rate of rhythmical action, such as those which make the heart beat at a greater speed; (3) inhibitory nerves, those which retard the rate of rhythmical motion, or stop it altogether; and (4) secretory nerves, those which cause secretion to flow out from the various glands. The chief kinds of afferent nerves are: (1) Those which convey impulses to the central system and there give rise to impulses to be carried away by efferent nerves, as in reflex action; (2) those which convey impulses giving rise to the special sensations of sight, hearing, etc.; (3) those which convey general or non-localised sensations; and (4) those which give rise to the experience of pain. The N. S. is also to be classified according to the anatomical disposition of the nerves and nervous

organs. The most convenient classification involves three divs.: the central N. S., the peripheral N. S., and the sympathetic nerves. These divs. are somewhat arbitrary, but are sanctioned by custom and convenience. The central N. S. consists of the brain and spinal cord. The peripheral system consists of the cranial nerves, the spinal nerves, the sense organs, e.g. the eye and ear, and the motor end-plates. The sympathetic system consists of the ganglia situated on either side of the spinal column, with their connections. Before describing these systems in detail the properties of nerve-substance in general must be discussed.

Nervous Tissue is of three kinds: nerve-cells, nerve-fibres, and neuroglia, or connecting tissue. Nerve-cells vary greatly in form and size. The form of cell which makes up the brain and spinal cord consists of a protoplasmic nucleated body, from which arise certain processes. One process is known as the axis cylinder process or axon, and the others are collectively called the dendrites. The axon possesses a uniform diameter and throws off collateral branches without diminishing in section, the dendrites divide into numerous branches, which taper off as they pass from the cell-body. The axon appears to be the structure by which communication is made between cell and cell, and it is an essential part, not only of a nerve cell, but of a nerve-fibre. In some fibres the thread-like axon becomes sheathed with a substance called myelin; it is then called a medullated fibre; if the sheath is absent, it is called a non-medullated fibre. Whether medullated or not, the fibre may possess a thin sheath called the primitive sheath or neurilemma, placed externally to the myelin if the fibre is medullated. The part of the brain and cord which contains nerve-cells is called grey matter, while the white matter of the brain and cord is made up of medullated fibres without a primitive sheath. The nerve-fibres which proceed to the various parts of the body are bound up in bundles which we call nerves.

Central Nervous System.—The central or cerebro-spinal system consists of the brain and the spinal cord, both of which are elsewhere described. The most important part of the brain is the cortex, which is made up of grey matter. There are subsidiary masses of grey matter in the interior of the brain, in the cerebellum, and in the spinal cord. It is in this grey matter that voluntary action arises, and to it are also brought the impulses which give rise to sensation. The subsidiary masses of grey matter are concerned with involuntary and reflex actions, while the white matter may be looked upon as a communicating medium only.

Cranial Nerves.—These nerves are concerned mainly with the supply of the head. There are twelve pairs of them, and they are spoken of by their numbers as well as their names: (1) The *Olfactory* nerve is purely sensory; it comes from the nose and proceeds to the cerebrum; it is the nerve of smell. (2) The *Optic* nerve is purely sensory; it enters the eyeball at the rear

and connects with the cerebrum by way of subsidiary masses of grey matter called the *corpora quadrigemina* and *corpora geniculata*. (3) The *Oculomotor* nerve is purely muscular, and supplies most of the muscles of the eye. (4) The *Trochlear* nerve is muscular, and supplies the superior oblique muscle of the eye. (5) The *Trigeminal* nerve is mainly sensory. It divides into three main branches for the upper, middle, and lower portions of the head and face region. It has a smaller motor branch for the muscles of mastication. (6) The *Abducens* nerve is motor and supplies the external rectus muscle of the eye. (7) The *Facial* nerve is a motor nerve, supplying the facial muscles. Injury to this nerve causes the loss of all power of facial movement and expression. (8) The *Auditory* nerve is divided into two parts: the *cochlear* nerve, which is the true nerve of hearing, and the *vestibular* nerve, which connects with the semicircular canals and conveys those impulses which enable the body to be kept in equilibrium. (9) The *Glossopharyngeal* nerve is mixed sensory and motor. Certain muscles of the pharynx are impelled to action by it, while other fibres are concerned in sense of taste. (10) The *Vagus* or the *Pneumogastric* nerve has varied functions; it contains fibres which convey motor impulses to the stomach and intestines, afferent impulses from the lungs, etc. (11) The *Spinal Accessory* nerve contains motor fibres for the larynx and some inhibitory fibres for the heart; it also supplies a few muscles in the neck and back. (12) The *Hypoglossal* nerve is the motor nerve for the tongue muscles.

The spinal nerves arise from the spinal cord and run out through holes between the vertebrae to supply the trunk and limbs, though some of the upper ones are concerned with the head and face. The div. into spinal and cranial nerves is arbitrary and not real. There are thirty-one pairs of spinal nerves, whose names depend on the part of the spinal column from which they pass. Thus there are eight cervical, twelve dorsal, or thoracic, five lumbar, five sacral, and one coccygeal. Each spinal nerve is a mixed nerve, containing both motor and sensory fibres. As they emerge from the spinal cord, the motor and sensory bundles are separated. The sensory fibres come from the back of the spinal cord; their point of emergence is called the posterior root, and a spinal ganglion is situated at that point, consisting of a collection of nerve-cells which have two axis-cylinders proceeding from them, by which the cells communicate in one direction with the skin, and in the other with the spinal cord or brain. The motor fibres sprout from the grey matter of the spinal cord, and proceed by way of the anterior roots to the mixed nerves, and thence to their destination in the end-plates of the voluntary muscles.

Sympathetic System.—Some of the anterior root fibres pass to a chain of ganglia running down on each side of the vertebral column and called the sympathetic chain. These ganglia consist of nerve-cells, and the fibres from the an-

terior roots branch round these cells and stimulate them to send out impulses by their own axis-cylinder processes to the involuntary muscles. The medullated fibres which carry the impulses from the spinal cord to the ganglia are termed pre-ganglionic; those which start from the ganglia are non-medullated and are called post-ganglionic. The impulses which affect the involuntary muscles must not be understood to originate in the ganglia. The ganglia serve as redistributing stations, where an impulse received from one afferent fibre may be communicated to a number of cells in the ganglion which convey by their own axis cylinders the impulses to the various involuntary muscles. Among muscles served are those which effect the peristaltic movements of the alimentary tract, those which constrict the arteries and regulate the circulation, including the muscles of the heart to some degree, the unstriated muscles of the lungs and windpipe, those which control the size of the pupil of the eye-ball, those connected with the sweat glands of the skin, etc.

See Sir C. Sherrington, *Integrative Action of the Nervous System*, 1908, 1947; F. Tilney and H. A. Riley, *Form and Functions of the Central Nervous System*, 1920, new ed. 1938; C. U. A. Kappers, *Evolution of the Nervous System in Invertebrates, Vertebrates, and Man*, 1920-21; E. E. Hewer and G. M. Sandes, *Introduction to the Study of the Nervous System*, 1923; E. D. Adrian, *The Basis of Sensation*, 1928; J. W. Papez, *Comparative Neurology*, 1929; V. M. Bekhterev, *General Principles of Human Reflexology*, 1933; and A. Kuntz, *The Automatic Nervous System*, 1934.

Nesfield, William Eden (1835-88), Eng. architect, b. at Bath. He led the Gothic revival, and his book, *Sketches from France and Italy* (1862), is a text-book on the subject. He designed Kimmel Park, Cloverly Hall, Loughton Hall, and Westcombe Park.

Ness (Eng. *nose*, A.-S. *næse*, Ger. *nase*, Icelandic *nes*, Lat. *nasus*, Fr. *nez*), geographical termination, signifying promontory. Names in -ness abound among the Orkney and Shetland Is., and on the coast of Caithness; and along the E. coast of Great Britain as far as Dungeness in Kent. As the corresponding termination -nes prevails in Scandinavia, the existence of names in -ness in Britain is held as an evidence of Scandinavian colonisation.

Ness, *Loch*, long, narrow lake in Inverness-shire, Scotland, extends N.E. and S.W., and is 23 m. in length and 1½ m. in average breadth. It receives the Morriston, the Oich, the Foyers, and other streams, and its surplus water is carried off to the Moray Firth by the R. N. In many places it is 130 fathoms in depth. In 1934 there was much controversy over the reported appearances of a supposed 'monster' in the loch. The Linnaean Society with a telephoto lens took a film of the 'creature' at a distance of 1 m. The general opinion was that it

was a seal; others believed it to be a shoal of otters.

Nesselrode, Karl Robert Vassilevich, Count (1780-1862), Russian statesman, b. at Lisbon, of Ger. descent. He took an active part in the negotiations for the peace of Tilsit in the Napoleonic campaign and acted as intermediary between Alexander I. and Talleyrand, always maintaining a policy of moderation. At one time he was attached to the Russian embassy in Paris. He was a member of the Congress of Vienna (1814-15), Russian minister of foreign affairs (1816), vice-chancellor (1829), and chancellor (1844). After signing the peace of Paris at the close of the Crimean war (1856) he retired.

could be truly called the 'Mother of God,' being in truth only the mother of the man Christ. N. warmly defended Anastasius, espoused this view, and elaborated it into the theory which has since been known by his name and which in practice exaggerated the distinction of two natures in our Lord into a distinction of two persons—the human person of Christ and the Divine Person of the Word. An animated controversy ensued, which drew from Cyril, patriarch of Alexandria, a formal condemnation of the doctrine of N. in twelve anathemas still preserved, and a similar condemnation, accompanied by a threat of deposition and excommunication, from Celestine, bishop of Rome. N.



British Rutledge.

LOCH NESS AT FORT AUGUSTUS

In the background is the Glengarry Forest, with the peak of Sron a Choire Ghairbh (3066 ft.), in the middle distance is the Caledonian Canal (River Quoich).

Nessus, see HERCULES.

Neston, dist. of Cheshire, England, part of the urb. dist. of N. and Parkgate, 12 m. from Chester, on the London Midland Region railway. It stands on the estuary of the Dee and is a coal-mining area. Pop. (with Parkgate) 7000.

Nestor, in Gk legend, was the son of Neleus, king of Pylos, the husband of Eurydice, and father of Perseus. When his father's kingdom was invaded by Hercules he alone of his brothers was spared. He fought against the Arcadians, Eleans, and Centaurs and took part in the siege of Troy. In his old age he was renowned for his wisdom.

Nestorian Church, see under NESTORIUS.

Nestorius (d. c. A.D. 150), native of Germanicia, a city of N. Syria, in the patriarchate of Antioch, was probably a disciple of the celebrated Theodore of Mopsuestia. Having received priest's orders at Antioch, he was selected by the emperor, in A.D. 428, as patriarch of Constantinople. Soon after his consecration, a controversy arose as to the divine and human natures of our Lord. One of the priests who followed N. to Constantinople, Anastasius, having in a sermon, which was by some ascribed to N. himself, denied that the Virgin Mary

remaining firm in his opinions, a general council was convened at Ephesus in 431, at which Cyril took the most active and prominent part, and at which notwithstanding the absence of the patriarch of Antioch and his bishops, N. was condemned and deposed. Considerable opposition was offered to this, but ultimately N. was confined in a monastery near Constantinople, whence, after four years, he was banished to the Greater Oasis in Upper Egypt, and after several changes in his place of confinement, d. in exile. Nestorian communities, now called Chaldeans, still exist in Iraq, Syria, Persia, Russia, and America. See G. P. Badger, *Nestorians and their Rituals*, 1852; F. Nau, *L'Expansion nestorienne en Asie*, 1911; J. Stewart, *Nestorian Missionary Enterprise*, 1928; and P. Y. Sacki, *The Nestorian Monuments in China*, 1928.

Nests, in natural hist., are the places chosen or constructed by birds or any other animal for incubation, hibernation, or general residence. They vary enormously, from mere saucer-like hollows in the ground to some of the most elaborate and beautiful structures found in nature. They originated primarily in the desire for concealment and protection, and birds that are content with slight depressions

In the ground, such as terns and plovers, lay eggs which so closely resemble the ground that they generally escape detection. A decided advance on this kind of nest is the burrow, such as that occupied by the sand-martin, kingfisher, or puffin. In many cases these underground N. are made in burrows left by rabbits or voles. Many birds and some animals make their N. in the hollows of trees; the female of the Bornean rhinoceros hornbill is sealed up by the male for many weeks, and thus absolutely protected. The mud N. of the swallow family and other birds are wonderful examples of industry. Some of these weigh as much as eight or nine pounds. Among the crudest N. that are made with collected material, such as sticks, leaves, blades of grass, or hair, are those of the wood-pigeon, which are so loosely put together that the eggs are visible through them. The evolution of such N. to the complex structures of the finches or the wrens and their choice of site is plainly due to the instinct of concealment. Some fish and some insects and spiders have developed great nest-building craft.

Swallows, martins, sparrows, and fly-catchers prefer houses as nesting sites; the thrush tribe, finches, and linnets use evergreen bushes and hedges. Most species construct N. which are highly distinctive, and chaffinches produce those of the highest quality. The better builders also prefer a particular sort of site, especially the warbler, which adapts its nest perfectly to its position, preserving a uniformity of height above the water or marsh. Generally the N. of home birds are more solid than those of visitors, the former having more time at their disposal. The blackbird's is one of the heaviest, and the lesser whitethroat's is of the lightest.

Nests, Edible, are produced in the Malay Is. and Australia by species of swifts, or swiftlets. In most of the mud-nest-building birds saliva is secreted to mix with the mud. In these swiftlets the secretory glands are so developed that the use of mud and other matter is abandoned, the nest being formed almost or entirely of the bird's own secretion. These N. are in great demand by the Chinese for making bird's-nest soup. From the Malay Is. millions of N. are annually imported into China.

Nesus, see LOLOS.

Netball, popular game in England for girls and women. It is played by two teams of seven players each, with an inflated ball (resembling a football) between 27 and 28 in. in circumference and 14-17 oz. in weight. N. is usually played out of doors on a concrete or grass court 100 ft. long by 50 ft. wide. The object of the game is to score goals by dropping the ball through a metal ring, 15 in. in diameter, which is placed at the top of a 10-ft.-high post. There is a post at each end of the court. Only two players on each side may 'shoot' for goal. The ball must be passed from one player to another without running with the ball. Kicking the ball and other rough play is penalised

by a free shot from the goal circle for the opposing side. The duration of play is decided by the captains of the two teams before the start of a game: it is usually 15 min. each way, with a few minutes' interval at half-time. The controlling body in England is the All-England Women's Association of Netball and other Handball Games.

Net Book Agreement, see under BOOKSELLING.

Nete, riv. of Belgium, trib. of the Rupel (q.v.). The N. is formed at Lier (q.v.) by the confluence of the Great and Little N., the main rivs. of the Campine region, both flowing from E. to W. The N. supplies the drinking water for the Antwerp agglomeration. The main filtering works are at Walem, 7 m. S.W. of Lier.

Netherlands Guiana, see DUTCH GUIANA.
Netherlands, The, see HOLLAND.

Nethou, see PYRENEES.

Netley, vil. in Hampshire, 3 m. S.E. of Southampton. There are ruins of a Cistercian abbey (Early Eng. and Decorated) dating back to the early thirteenth century. N. Hospital was opened in 1863 for invalided soldiers.

Nets are fabrics in which the threads cross each other at right angles, leaving a comparatively large open space between them. Netting differs essentially from weaving in that the threads are knotted at the intersections. The open spaces in N. are called meshes, and these correspond in size with an instrument used in net-making, consisting of a flat piece of wood or other hard substance, usually about the shape and size of a common paper-knife. In addition to this, a peculiar kind of needle is used, upon which a large quantity of the thread is placed, by winding it from end to end between the forked extremities. The art of net-making has been practised from the earliest times by the most savage as well as the most civilised nations. It is easy to see that the human race learned the value of this art from noticing how frequently land and water animals became entangled in the shrubs and weeds through which they attempted to pass. There are many illustrations of the uses of N. in the bas-reliefs of Assyria, Greece, and Rome, and in the mural paintings of Egypt. Until recently N. have been always made by hand. Hemp is the chief material for net-making. After the net comes from the loom it goes to the finishers, who, by hand, make the addition of a kind of selvage, consisting of several thicknesses of twine, to give strength to the edges. A great variety of N. are in use amongst fishermen, but the primi are the seine, trawl, and drift N. See further under FISHERIES.

Nettle, name given to a number of annual and perennial herbs, characterised by stinging hairs on leaves and stems. The great N. (*Urtica dioica*) is a perennial with small green flowers in long, branched clusters. The tender tops are sometimes boiled and eaten as a vegetable in spring. Its fibre yields a yarn, said to be superior to jute and hemp, though inferior to

flux, and is valuable for damasks and brocades. Some species are used in the manuf. of ropes and textiles. The small N. (*U. urens*) is an annual, with flowers in a short seldom branched cluster. *U. pilosiflora*, a doubtful Brit. native, found on the E. coast of England, is more virulent than the others. Dead-N. (*q.v.*) is of a different species, even though the white dead-N. (*Lamium album*) resembles in appearance the stinging N.



Left Leaf of Stinging-nettle.
Right Leaf of Dead-nettle.

Nettlerash, or Urticaria, disease of the skin characterised by the development of raised red or white warts similar to those produced by the sting of a nettle, and accompanied by a burning and itching sensation. The cause is some digestive disturbance, due to the ingestion of certain food, such as shell-fish, strawberries, cheese, etc. The best treatment is the administration of a purgative combined with an antacid, such as magnesia.

Nettuno, seaport of Italy, 32 m. S.E. of Rome. Pop. 12,800.

Neubrandenburg, walled tn. of Germany, in Mecklenburg, 71 m. N. of Berlin. It contains four handsome Gothic gates of fourteenth-century workmanship. The former grand-ducal palace of Belvedere stands on a hill overlooking Lake Tollense. Pop. 15,200.

Neuburg, tn. of Bavaria, on the Danube, 45 m. N. by W. of Munich. Pop. 7,800.

Neubydzow, tn. of Bohemia, Czechoslovakia, 50 m. E.N.E. of Prague. Pop. 7,000.

Neuchâtel, or **Neufchâtel**, known also as **Neuuenburg**: 1. Canton in the W. of Switzerland, between Lake N. and the Fr. frontier. N. lies in the midst of the Jura Mts., four chains of which, running from N.E. to S.W., traverse the canton. The greater number of the numerous streams which water the canton flow into the Rhine. Among these mt. torrents the prin. are the Reuse, the Seyon, and the Serrière. The lake of N. is 25 m. long, and from 3 to 54 m. wide. It is 1420 ft. above the sea and has a depth of 400 or 500 ft. The natural products are iron ores, coal, asphalt, fruit, including

grapes—from which good red and white wines are made—timber and corn. The rearing of cattle constitutes an important branch of industry, and large quantities of cheese are exported; but the speciality of the canton is watch-making and the chief centres of this industry are La Chaux-de-Fonds and Le Locle. Area 309 sq. m. Pop. 131,000. N. joined the Swiss Confederation in 1815. Five representatives are sent to the Nationalrat. 2. The chief tn. of the canton occupies a magnificent site on the N.W. shore of the lake of N. 25 m. N.W. of Bern, and is noted for its many charitable institutions and for the beauty of its charmingly situated environs. It has had a univ. since 1909. It is the seat of the watch-making industry, and also manufs. jewellery and condensed milk. Pop. 23,000.

Neudamm, tn. of Polish Debno, 11 m. from Kustrin (now Kostrzyn). The chief manufs. are cloth and hats. Pop. 7,600.

Neudorf, tn. of Silesia, Poland, 5 m. W.S.W. of Königs-hütte. Pop. 6,000.

Neudorf, *see* IGLO.

Neuendorf, vil. in the Rhineland, Germany, 2 m. from Koblenz.

Neuern, com. of Bohemia, Czechoslovakia, 10 m. from Carlsbad. Pop. 22,000.

Neufahrwasser Harbour, *see* DANZIG.

Neuchâtel, Switzerland. *see* NEUCHATEL.

Neufchâtel-en-Bray, tn. of the dept. of Seine-Inférieure, France, on the Béthune, 50 m. N.E. of Rouen. It is noted for its cheese and cider. Pop. 4,000.

Neuhaldensleben, tn. of Saxony-Anhalt, Germany, on the Ohre, 15 m. N.W. of Magdeburg. Pop. 17,000.

Neuhäusel, tn. of Neutra co., Czechoslovakia, 16 m. N. of Komorn. The Hungarian name is Ersekujvár. Pop. 13,500.

Neuhoff, Theodor von (c. 1690–1756), Ger. adventurer. He entered the service of Charles XII. of Sweden, and was an ardent supporter of the Jacobite cause. His fame rests upon his assisting the Corsicans against the Genoese, and ultimately ascending the throne as Theodor I. He was soon obliged to abdicate, and was on more than one occasion thrown into prison for debt.

Neuilly-sur-Seine, suburb of Paris. The castle of St. James, situated here, and dating back to 1775, has been converted into a lunatic asylum and the Galenham Institution. There is a great midsummer fair. Pop. 60,200.

Neu-Kolin, *see* KOLIN.

Neukölln, tn. of Germany, formerly called Rixdorf, a S.E. suburb of Berlin, in the Potsdam dist. Has textile industries. Now part of the city of Berlin. Pop. 311,700.

Neumann, Alfred (b. 1895), Ger. novelist and dramatist, b. at Lautenburg, Prussia. Educated at the Gymnasium, Berlin, and Rostock. Reader for Georg Müller, Munich publishers. Playwright for Little Theatre, Munich (1918–20). Known chiefly for his many historical novels, in which he uses the lessons of the past to illustrate present-day political situations and problems. *Der Patriot* (1925).

exploiting the assassination of the Tsar Paul of Russia, was dramatised in London as *Such Men are Dangerous* (1928). Literary recognition and the Kleist prize came with *Der Teufel* (1926) on the despotism of Louis XI. *Rebellen* (trans. as *The Rebels*, 1928) and its sequel *Guerra* (1929) had the Carbonari and It. independence respectively as their theme. *Der Held (The Hero)* (1930) is founded on the murder of Rathenau (q.v.) in 1922. Historical portrayal is again the background of *Königin Christine von Schieden* (1926) (Eng. trans., 1935), but the thrill lies in the erotic peculiarity of the queen—her early Lesbian experience and her love for Cardinal Azzolino and Mondaleschi. *Narringspiegel* (1932) departs from the unalloyed historic manner by reason of its coarse Rabelaisian humour as instanced by the hero's enormous pendulous stomach. N.'s plays include *Königsmaske* (1928), *Frauenclub* (1929), and *Hans Danieli* (1931). With the Nazis' advent to power N. went to America, writing there *Neuer Caesar* (1934) and *Kaiserrreich* (1936) (trans. as *Gaudy Empire*, 1937). He has also written a biography of Musset (1925), novelties, short stories, trans. of Musset, Molieré, and Lamartine, essays, and poems.

Neumann, Balthasar (1687-1753), Ger. architect. Pioneer of the Ger. baroque style. Among the buildings he designed were the archiepiscopal residence at Würzburg (1719-44), the summer schloss at Werneck (1731-36), and the abbey, church at Neresheim (1745-92).

Neumann, Therese (b. 1898). Bavarian visionary, b. at Konnersreuth. She received the stigmata, i.e. marks, of the five wounds of Christ, during Lent 1926, experiencing on every Friday a vision of Christ's Passion. The reason for her stigmatism has been explained in various ways. See A. Lechner, *Das Rätsel von Konnersreuth im Lichte eines neuen Falles von Stigmatisation*, 1933; Pacificus, *The Story of Teresa Neumann*, 1947; and Hilda Graef, *Difficulties in the Case of Teresa Neumann*, 1950.

Neumünster, tn. in Schleswig-Holstein, Germany, 50 m. N. of Hamburg. It is an anc. city, and was originally called Wildendorp. Pop. 46,900.

Neunkirchen: 1. Tn. of the Saarland, Germany, on the R. Blies, and 12 m. distant from Saarbrücken. Pop. 35,000. 2. Mrkt. tn. in Lower Austria, about 8 m. distant from Wiener-Neustadt. The prin. trade is in woven goods and metals. Pop. 12,000.

Neuquén, ter. of Argentina, between the Colorado and Limay Rrs., with an area of 37,245 sq. m. and a pop. of 590,550. The surface on the whole is mountainous and the prin. riv. is the N. N. is also the name of the cap. of the ter. It is situated in the N.W. corner of Patagonia on the Roca railway, 700 m. from Buenos Aires. Near at hand is the great Río Negro barrage. Pop. 10,000.

Neuralgia (Gk. νεῦρον, nerve; ἀγος, pain), pain along the course of a nerve not associated with any demonstrable change in structure. This definition is not always

applicable, for the pain is often accompanied by swelling, redness, etc.; but in the large majority of cases the cessation of the neuralgic pains leaves the patient as he was before the attack, with the exception of a degree of exhaustion. The pain is of a paroxysmal character; its onset is sudden, and its cessation no less so. It may even take on a periodic character, recurring at the same time of day for weeks or recurring at fairly regular intervals of a few weeks. There is usually a fair degree of localisation: the patient feels the most intense pain at particular points, though it may often be felt diffused throughout the area served by a nerve. It is often difficult to assign a cause to a neuralgia attack. Generally speaking, hereditary influences, poor nutrition, fatigue, or worry are predisposing causes. Persons of gouty or anaemic tendencies are apt to suffer from N. Occasionally it follows periods of excitement or overwork, and is often associated with the abuse of drugs, as alcohol and tobacco. It is a regular accompaniment to malaria, and cold, damp conditions are favourable to its development. In some cases it can be seen to be due to the pressure of a tumour or of inflamed matter in the course of a nerve, and some of the most obstinate varieties are attributed to the pressure of a bony structure upon the nerve as it passes through a foramen. The immediate cause of a paroxysm may be any sudden shock or jar, change of temp., sudden movement, or any marked change in consciousness, such as the mere dread of a recurrence. Neuralgic pains are usually classified according to their anatomical situation. *Tic dououreux* is a distressing variety affecting the trigeminal (5th cranial) nerve. The paroxysm is unusually sudden, and is usually of short duration. The pain is felt at the side of the head, and is seldom experienced on both sides at once. The skin may become red and swollen, and tender points can be located where the pain is extraordinarily intense; these are situated where the nerves emerge from the deeper-lying tissues. *Supraorbital* N. affects the brow. The pain is less intense in character than that of tic dououreux, but tends to remain for a longer period. It is often associated with the condition called *migraine*, in which symptoms of an hysterical nature are observed. *Intercostal* N. affects the nerves which emerge from the front of the spinal cord. The difficulty of localising it exactly sometimes gives the impression that a pleuritic affection is the cause of the trouble. It sometimes occurs with herpes zoster, or shingles. *Sciatica* is an obstinate form of N. affecting the great sciatic nerve; it is most distinctly felt in the neighbourhood of the joints, and is usually caused by exposure to wet or cold, or to the over-long maintenance of a fixed position of the lower limbs.

The treatment of N. should aim at eliminating the predisposing cause. Good hygienic conditions with plenty of rest and absolute freedom from worry are indispensable. Of drugs, morphia, antipyrin, phenacetin, and aspirin are most satis-

factory. Lotions and plasters of belladonna, aconite, laudanum, and chloroform are recommended as soothing applications. Electrical treatment can also be tried. Operative measures are seldom called for, but success in obstinate cases has been achieved by exposing the nerve and stretching it. A purely sensory nerve, such as the trigeminal, can be inactivated by an injection of alcohol; surgical extirpation of the trigeminal and its Gassonian ganglion are sometimes carried out.

Neurasthenia (*Gk. νέυρον, nerve; ἀσθενία, weakness*) is a comprehensive term which was formerly very loosely applied to a large number of psychogenic disorders characterised by nervous exhaustion, difficulty of concentrating attention, predisposition to fatigue and disinclination for bodily effort, loss of memory, sensation of pressure on the head, spinal irritability, insomnia, disturbance of digestive functions (including constipation, sense of fullness after eating, and flatulent dyspepsia), disturbance of sexual functions (involving amenorrhoea and dysmenorrhoea in women, and impotence and spermatorrhoea in men), disturbances of the special senses (involving headaches, blurring of vision, regional anaesthesia, etc.).

The outlook upon N. has completely changed of late years. It is now recognised that many of the conditions which were formerly labelled N. were either anxiety states or hysteria-syndromes, and the term is now reserved for conditions presenting a clinical picture in which fatigue is the sole or at least the leading symptom. The result is that, compared with formerly, the term is now rarely used. Views regarding its aetiology have also undergone a complete change. It is increasingly realised that though, in a number of cases, the onset of N. corresponds to a period of worry and overwork, or to a shock, those are merely the occasion, not the cause, of the illness. The neurasthenic suffers from an arrest of psycho-sexual development; remaining at a level of preoccupation with himself and his interests, unable to adjust himself to the need of open and outward manifestation which is essential to success and happiness. He suffers from a fixation at an auto-erotic level of development which hinders him from the activities which win social esteem and self-respect. This state is reflected in the feeling of guilt which plays an important role in the psychological make-up of the neurasthenic. The modern concept of its aetiology has inevitably led to a readjustment in the views formerly held regarding its treatment. On the assumption that overwork was the prin. cause and that the symptoms were therefore due, almost directly and wholly to fatigue, treatment was formerly aimed at enforcing absolute rest. In the Weir-Mitchell treatment, for example, in order to prevent even the slightest expenditure of unnecessary energy, the patients were not allowed even to feed themselves. While the importance of suitable diet and adequate rest in hygienic surroundings is,

of course, still recognised, psychotherapy is now regarded as essential if a complete cure is to be achieved. See G. Bilezikian, *Neurasthenia*, 1911; R. Vittoz, *Treatment of Neurasthenia by Means of Brain Control*, 1928; D. M. Armitage, *Challenge to Neurasthenia*, 1935; and D. K. Henderson and R. D. Gillespie, *A Text-book of Psychiatry*, 1944.

Neurath, Baron Konstantin von (b. 1873), Ger. politician and diplomatist. He was ambas. in Constantinople (1914), minister to Denmark (1919), ambas. to Italy (1922), and to Britain (1930). Ger. minister of foreign affairs (1932-38), president of the privy council from 1938. Reich 'protector' for Bohemia and Moravia (1939-41). On resignation from the latter position he retained formal relationship with the Nazi Gov. as minister without portfolio. N. advised Hitler to withdraw from the disarmament conference under the League of Nations and played an important part in Hitler's decision to reoccupy the Rhineland. As 'protector' of Bohemia and Moravia, he set up an administration similar to that in Germany. He abolished political parties there and trade unions, introduced Nazi racial laws, and compelled Czech industry to work for the Ger. war effort. The Nuremberg tribunal (g.v.) found that in administering these fars, he played a prominent part in the wars of aggression which Germany was waging in E. Europe, and that war crimes and crimes against humanity were committed under his authority; but in mitigation the tribunal noted that he had intervened with the security police and secret service for the release of many Czechoslovaks who had been arrested when war broke out, and it was also noted that in 1941 N. was summoned before Hitler, who complained that his regime had not been harsh enough. N. was sentenced by the tribunal to fifteen years' imprisonment.

Neuritis, Inflammation of a nerve, may be localised or multiple. In localised N., caused by injury, cold, pressure, etc., there is considerable pain along the course of the nerve. Multiple N. is the simultaneous inflammation of nerve trunks, often symmetrically situated on both sides of the body. N. may result from the toxins of micro-organisms, e.g. those of diphtheria, influenza, syphilis, malaria, smallpox, dysentery, etc. Poisoning by alcohol, arsenic, lead, copper, phosphorus, carbon monoxide, and anilin compounds, or auto-intoxication through diabetes or anaemia, may also be exciting causes of N. The symptoms vary according to the cause. There is numbness, loss of power and atrophy of muscle in certain parts.* In milder cases the atrophy disappears, but in other cases there may be ultimate paralysis of the parts. At first the superficial reflexes may be exaggerated, but are later lost as a rule. Treatment deals, in the first instance, with the relief of pain. Cathartics and diaphoretics may be useful, and sometimes massage and muscular movements of various types. The only cure, however, is the elimination of the poison, and hence the treatment

followed depends upon the real cause of the N. See S. E. Jelliffe and W. A. White, *Diseases of the Nervous System* (fifth ed., 1930).

Neurosis (Anxiety Neurosis, etc.), see PSYCHONEUROSES.

Neusalz, see NOWA SÓŁ.

Neusatzt, see UJVÍDEK.

Neusatzt, Yugoslavia, see NOVI SAD.

Neusiedler-See (Fertö-tava), lake of Hungary, between the cos. of Oedenburg and Wieselburg, 19 m. from Pressburg. It has an area of about 120 sq. m., but it is of varying size, and sometimes dries up in part. Eastward it is united with the extensive marsh called the Hanság, through which it is in communication with the R. Raab and with the Danube.

Neuss (the Rom. Novesium), tn. in the N. Rhine-Westphalia, Germany, on the Rhine at the confluence of the Erft, about 3½ m. from Düsseldorf. There are manufs. of soap, paper, chemicals, and engineering products, and the tn. is an inland port. Pop. 30,000.

Neustadt: 1. Tn. in Poland, 24 m. N.W. of Danzig. Pop. 7000. 2. Seaport of Schleswig-Holstein, Germany, on the Baltic, 18 m. N.N.E. of Lübeck. Pop. 5000. 3. Tn. of Bavaria, Germany, about 9 m. N.E. of Coburg. Pop. 6000. 4. Tn. of Silesia, Poland, 33 m. from Ratibor. The chief industries are tanning, dyeing, and the manuf. of damask linen, woolen stuffs, leather, and beer. Pop. 20,000.

Neustadt-an-der-Hardt, tn. in the Rhine-land, Germany, 17 m. S.W. of Mannheim. There is a trade in wood, grain, fruit, and wine. Its church, with sev. curious monuments of the counts palatine and with some ant. frescoes, was finished in the fourteenth century. Pop. about 24,000.

Neustettin (Polish Szczecinek), tn. of Poland, 55 m. S.E. of Kolberg. Noted before the Second World War for a considerable trade in cattle and agric. products, iron founding, and dyeing and brewing industries. Pop. 20,000.

Neu Strelitz, tn. of Mecklenburg, Germany, between Lakes Ticker and Glambecker. It was founded in 1773, is built in the form of an eight-rayed star, and contains the ducal palace, with a large library, and having magnificent gardens attached. Pop. 26,000.

Neustria, name given to the W. div. of the Frankish Empire to distinguish it from the E. div., Austrasia.

Neutralisation, Heat of, see under HEAT OF FORMATION.

Neutrality, in international law (q.v.) the condition of states which stand aloof from a war between other states, the essential feature of the condition being this negative attitude and not the positive attitude of offering impartial treatment to the adversaries. The word itself is of recent origin, as in the olden times when states were at war, all other states concerned were considered as on one side or the other. Late in the seventeenth century it was recognised that neutral states should give no assistance to belligerents, but such points as to what

extent neutrals could prevent their being used for hostile purposes, etc., were by no means clearly understood. The development of opinion gradually imposed stricter obligations upon neutral powers; e.g. it was once common for neutrals to supply troops to one of two belligerents under a previous treaty, and the practice was followed as late as 1828. The Hague Conventions of 1907 contain no specific prohibition of the supply of troops in land warfare, though the practice became extinct until the Sp. civil war, 1936, when Germany and Italy, though nominally neutrals, sent troops to aid the insurgents against the republicans. In regard to naval warfare, it was agreed that the supply, in any manner, directly or indirectly, of warships, supplies, or war material of any kind by a neutral power to a belligerent power be forbidden. But a neutral is not bound to prevent the export or transit, for either belligerent of arms, munitions of war or, in general, of anything which could be of use to an army or fleet. In matters which do not relate to war a neutral must not refuse to one belligerent any advantage which she grants to the other. The question in regard to N. which has caused more controversy than any other is that respecting neutral goods on belligerent vessels, and vice versa. It was at first held that the ownership of the goods on board the vessels was the only thing to be considered; thus merchandise belonging to the enemy was seized on a neutral ship, but neutral merchandise seized under a hostile flag was restored. This system led to so much inconvenience and irritation that the opposite principle was adopted, and neutral merchandise under a hostile flag was seized, and hostile merchandise was safe under a neutral flag. See on this CONTRABAND; DECLARATION OF LONDON; DECLARATION OF PARIS.

It is a violation of N. for a neutral state to make a money loan to a belligerent, but it is more open to doubt in cases where the loan issues from neutral individuals. Though neutral states are not bound to prevent their subjects from lending money to belligerents in the ordinary way of business, they have, in circumstances of grave difficulty, deemed it right to impose restrictions, as in the First World War, when the U.S.A. declared that loans from Amer. bankers to any foreign nation which was at war was inconsistent with the true spirit of N. This declaration was deprecated in America, but the secretary of state adhered to it. As to the use of neutral ter. for fitting out warships, the *locus classicus* is the declaration of Jefferson, who held that it was incompatible with the sovereignty of the U.S.A. and tended to interrupt the peace and good understanding between America and Great Britain to allow Fr. ships to be fitted out in Amer. ports; and the soundness of this opinion has never been seriously questioned. The dividing line between acts which the neutral is bound to restrain and those in which its subjects can engage at their peril is not always

easy to decide. The distinction came into prominence in the famous *Alabama case*, where ultimately it was agreed, by the treaty of Washington, 1871, to refer the matter to arbitration (for the facts see ALABAMA, TIE). By the decision of the arbitration board in the *Alabama case*, it was laid down that a neutral gov. is bound to use due diligence to prevent the fitting out in, or departure from, any of its ports of a vessel which it has reasonable ground to believe is intended to carry on war with a power with which it is at peace; and that it is bound to prevent a belligerent making use of its ports as a basis of naval operations, or a source of recruitment of men or military supplies. It is the belligerents' duty to respect neutral ter. and territorial waters, but it is hardly necessary to point out that Germany in 1939 and after respected the rights of no neutral, either in those or in any other respect. Neutral states have the right to repress the intercourse of neutral citizens with citizens of either belligerent, if desired. Belligerents have the right of blockade, of injury (Lat. *anuria*, forced service), of visit and search, and of the confiscation of contraband of war. neutrals must prevent any recruiting, etc., for either belligerent, and must grant impartially all privileges, etc., which are not considered as intervention in the struggle.

The right of *asylum* was considered by the privy council in 1916, when the Crown claimed to requisition neutral property taken in prize. It was decided that the right is to be enforced only by application to the court, which must determine whether, under the particular circumstances, it is exercisable. In 1918 Great Britain and the U.S.A. had recourse to the right in the case of property not in the control of the prize court, by requisitioning a number of Dutch vessels that were in Brit. and Amer. ports. A neutral is allowed to give *asylum* to the troops or vessels of belligerents in circumstances which ensure that the use of its hospitality will be unaggressive. Thus, in 1871, a Fr. army sought *asylum* in Switzerland, and in the First World War Brit. and Ger. troops both sought refuge in Holland. Such troops must be interned as far as possible at a distance from a theatre of war, but officers may be released on parole. It is agreed that belligerents may not erect on the ter. of a neutral a wireless telegraph station or apparatus intended to serve as a means of communication with belligerent forces, nor use any installation of the kind estab. by them before the war on the ter. of a neutral exclusively for a military end and which has not been opened for the service of public correspondence. Thus, in 1914, Great Britain and France successfully protested against the use by Germany of wireless installations in Ecuador and Colombia.

American Neutrality Legislation.—Even the most powerful states are compelled sometimes to make sacrifices of neutral rights in order to keep out of war. This has been the case in Amer. hist. as in 1807 when Jefferson induced Congress to pass the Embargo Act, forbidding foreign

commerce altogether by way of retaliation to Britain for her practice of searching Amer. vessels for refugee naval ratings and to France for the Berlin and Milan decrees; and again in 1935-37 when Congress passed laws giving up certain maritime rights. The freedom of the seas was, therefore, voluntarily sacrificed in the hope of keeping out of war. It was largely in vindication of the freedom of the seas that the U.S.A. fought the war of 1812 and that it entered the First World War in 1917. It would seem that trading with a belligerent is hardly consistent with N. in fact, though it may be allowed by the theory of international law. In the First World War Amer. sentiment was strongly pro-Ally before the abandonment of N. Amer. industry geared itself rapidly to Anglo-Fr. war needs, and Amer. banks acted as purchasing agents for the Allies, floated loans for them, and estab. allied credits, but Amer. trade with the central powers was reduced to negligible proportions. Consistently with its strong element of isolationism or nationalism, coupled with disillusionment with the results of the First World War, Congress strove from 1934 onwards to legislate a cast-iron N. In 1934, when war between Italy and Ethiopia was imminent, Congress wanted to erect insuperable barriers against the export of arms, and laid down rigid rules applicable to all belligerents. Roosevelt, on the other hand, wished to be in a position to carry out a policy of helping in 'collective effort' against 'the responsible and guilty party' or, in other words, he wished the N. laws to give him a wide discretion, enabling him to deter or cripple aggressors and to help their victims. No fewer than fifteen N. Bills were introduced and the resultant was a measure which prohibited the export of arms or implements of war to any belligerent nation, or to any country which might tranship to a belligerent made it lawful for an Amer. vessel to carry arms for or to any belligerent; and authorised the President to warn Amer. citizens that they travelled on the ships of belligerents at their own risk. The President was allowed no power to differentiate between righteous and wicked, aggressor or victim. He was permitted some discretion in defining the terms 'arms, ammunition, and implements of war' and in extending the embargo to states which might become involved in the conflict; but otherwise his hands were tied. There is but little doubt that President Roosevelt ought to have vetoed the measure, for there is evidence that when the Brit. Gov. was weighing the chances of war with Italy its cautious tendency was accentuated by the existence of this Amer. N. law. The Neutrality Act, however, was silent on civil wars, or on wars partly civil and partly foreign, like the Sp. civil war, and when Germany, Italy, and Russia all took a free hand in that war, Congress tried to repair the omission by means of a joint resolution forbidding the export of arms to Spain (Jan. 8, 1937). This, however, operated unfairly to the Sp. republicans, for the Brit. and Fr. Govs. had failed to

get other gov's. to observe the 'non-intervention' agreement which they had signed. Germany and Italy broke their neutral or 'non-intervention' pledges and sent not only munitions but men to the insurgents. Thus the embargo did not safeguard Amer. N. because that was never threatened; it merely played into the hands of the aggressor nations. The N. law of 1935 expired on May 1, 1937. America's belief in collective security had gone. Congress was again resolved on a rigid statute, especially one which should include such vital war commodities as scrap metal, copper, and cotton. The N. law of May 31, 1937, retained the embargo on arms etc., for all belligerents and the provision making it unlawful to deal in belligerents' securities; and it made travel by Amer's. on belligerent ships unlawful. It allowed the President to extend the embargo to any civil war which threatened the N. of the U.S.A. Its most striking provision, however, was the introduction of the 'cash-and-carry' clause, which in effect meant that after a war had begun those who wanted certain prescribed commodities or goods must come and get them and in effect pay for them. This Act, which was limited to two years' duration, marked the zenith of isolationist sentiment and was justifiably condemned by Mr. Cordell Hull as substituting 'a wretched little bob-tailed, sawed-off' domestic statute for the estab. rules of international law.' Subsequent events, which need not be detailed here, showed that it utterly failed of its purpose and in any case it was not flawless, for it was not truly neutral. The Act was in fact an encouragement to Germany's aggressive policy, as the Nazi Gov. naturally hoped that Britain and France would not be able to get war material from America in wartime. Roosevelt urged repeal of the arms embargo early in 1939, and partial repeal was approved by the House of Representatives in July 1939; but the President insisted on full repeal and, eventually, Congress passed the Neutrality Act of Nov. 4, 1939, which provided that Amer. arms, etc., might be sold to belligerent countries only on a cash-and-carry basis. It was forbidden to any person within the U.S.A. to buy bonds or other obligations of a belligerent country gov., issued after the outbreak of war, or to extend credits to such gov. with the exception of certain commercial credits of a character ordinarily used in peace-time. Amer. ships were forbidden to carry supplies to belligerents or to enter combat zones; the coasts of the Brit. Isles, France, Belgium, Holland, Germany, Scandinavia, and the Mediterranean were declared combat zones. Amer. citizens were not to travel on ships of belligerents. Licences were required for arms exports. The Act did not apply to Amer. republics.

See W. Hall, *International Law*, 1880; L. Jones, *Law and Commerce*, 1907; F. Birkenhead, *International Law*, 1927; L. Oppenheim, *International Law* (vol. II, *Disputes, War, and Neutrality*), 1928; and N. G. Politis, *Neutralité et la paix*, 1935.

Neutrality, in chem., is the state of a

substance that has no effect on indicators (q.v.). More strictly, a neutral aqueous solution is one in which the equivalent concentration of hydrogen (q.v.) is exactly equal to that of the hydroxyl ions. On adding an acid to an alkali, a substance is at length formed that shows no reaction of either an acidic or an alkaline character; the alkali and acid are then said to have neutralised one another.

Neutrality Zone, American, zone of 300 m., and in some places up to 600 m., around the whole Amer. continents except Canada, estab. by the 'Declaration of Panama' at a conference of the twenty-one Amer. republics at Panama on Oct. 3, 1939. It was suggested at this conference that all warlike acts at sea or in the air should be prohibited in this 'zone of security,' and in case of necessity enforced by joint action. The zone of security, however, was estab. only in theory and provision was made for mutual consultation on practical measures should hostilities occur in it. After the battle off Monte Video (Dec. 13, 1939), in which the *Admiral Graf Spee* (q.v.) was sunk, consultation was initiated, and naval experts recommended that the republics should intern all belligerent warships calling at Amer. ports. The Brit. Gov. protested against the estab. of the N. Z. as incompatible with International law, and as likely to lead to the Ger. using the Amer. ports as a sanctuary for their ships. In fact, the zone did not come into practical existence.

Neutron, one of the elementary constituents of matter, a particle with the mass of a proton (q.v.) but no electric charge. The idea that such a particle existed was suggested by Lord Rutherford in 1920. It is perhaps a combination of a proton with a negative electron. Ns. may be obtained by the bombardment of (e.g.) beryllium by alpha particles, i.e. rapidly moving helium atoms which have lost two negative electrons and are therefore charged with two units of positive electricity. It was the fact that the N. hits protons, the nuclei of hydrogen atoms, and the nuclei of other sorts of atoms that led to its discovery. The probability of interaction between a N. and an electron is according to the square of the ratio of their masses, and as the N. is over 2000 times as massive as the electron this probability is over a million to one; and hence the chances of interaction between Ns. and electrons are a million times less than between Ns. and protons.

Neu-Ulm, tn. of Bavaria, Germany, situated opposite Ulm on the Danube. Pop. 12,700.

Neuve Chapelle, vil. in the dept. of Nord, France, 8 m. S.W. of Armentières. There was an important battle around N. C. in 1915, in which the old vil. was almost entirely destroyed. The battle lasted from March 10 to March 12, 1915. Brit. and Indian forces began the attack, in an effort to prevent Ger. reinforcements going to the E. front, and to assist the Fr. The Brit. won initial success, but by March 12, Ger. reinforcements had been brought up and no further ground was

captured, although the Brit. held the positions gained earlier. Brit. and Indian casualties totalled over 11,000, of which 2527 were dead. In 1927 a memorial to the Indian dead was unveiled at N. C.

Neuville, Alphonse Marie de (1838-85), Fr. painter, pupil of Delacroix and Pictot. His large canvas depicting an episode in the siege of Sebastopol made a great sensation in 1859. This was followed by a series of military pictures dealing with the Crimean and Franco-Prussian wars.

plateau with an elevation of 5000 ft., but in the S. it descends abruptly to the level of the Colorado R. (600 ft. above sea level). The extreme S. boundary is formed for about 150 m. by the Colorado, and the Humboldt R. flows across over 300 m. of the N. dist. but this and other smaller streams end in salt lakes known as sinks. The climate is very dry and the soil barren except where irrigation has been effected. There maize, wheat, barley, and potatoes are grown, but crops are chiefly sub-



E.N.A.

NEVADA: THE STATE HIGHWAY BETWEEN VICTORY AND LINCOLN

His most famous picture is 'The Last Cartridges.' He also collaborated with Detaille in the panorama of Rezonville, one of the best works of the kind.

Neuwied, tn. of the Rhineland, Germany, on the Rhine, 8 m. N.N.W. of Koblenz. It possesses an ant. castle famous for its Rom. antiquities. There is manuf. of iron goods, tobacco, and soap. Pop. 21,500.

Neuzen, or Terneuzen, see TERNEUZEN. **Neva**, riv. of Russia, which flows W. from the S.W. corner of Lake Ladoga to the bay of Kronstadt, in the gulf of Finland. Its length, including windings, is about 40 m., and it is an important commercial riv.

Nevada: 1. One of the W. mt. group states of the Amer. Union in the great Cordilleran plateau, between the Rocky Mts. and the Sierra Nevada, bounded on the N. by Oregon and Idaho, on the E. by Utah, Arizona, and R. Colorado, on the W. and S. by California. The surface is a

desert to the grazing of sheep and cattle. There are some 5,000,000 ac. of forest, especially of silver and gold. Other minerals are copper, lead, zinc, iron, mercury, tungsten, gypsum, graphite, sulphur, vanadium, magnesite, antimony, nickel, cobalt, and borax. In 1945 the value of the mineral output was \$31,517,000. Copper smelting is the chief industry. The mts. have yielded over \$1,000,000,000 of mineral wealth, of which the former Comstock lode has produced 60 per cent. The chief tns. are Reno (21,300), which has a state univ. and an aerodrome, Las Vegas (8400), Sparks (5300), and Carson city, the cap. (2400). Nevada was admitted to the union in 1864, and is represented in Congress by two senators and one representative. Its legislature consists of a senate of seventeen members and an assembly of forty-one members. It has a land area of 110,540 sq. m., 1300 of which is Indian reservation. In this

state the death penalty is inflicted by means of lethal gas. The short period of residence for divorce, six weeks, makes Reno a favourite resort for this purpose. Pop. (1940) 110,200; estimated pop. in 1944, 156,445, an increase of over 41 per cent. See J. G. Scrugham, *A History of Nevada*, 1935, and D. L. Morgan, *The Humboldt: Highroad of the West*, 1943.

2. City and co. seat of Vernon co., Missouri, U.S.A., 88 m. S. of Kansas city. The chief industries are the smelting of lead and zinc and the manuf. of paper, lumber, sheet metal, and bricks. Coal is mined in the vicinity. Pop. 8100.

Nevers (ancit. Noviodunum), chief tn. of the dept. of Nièvre, France, on the r. b. of the Loire at its confluence with the Nièvre. It is the seat of a bishopric. The cathedral of St. Cyr dates back to the fourteenth century. Manufs. include iron goods, chemical products, footwear, and porcelain. Pop. 116,700.

Neveu, Ginette (1919-49), Fr. violinist, b. in Paris. She studied at the Paris Conservatoire and with Karl Flesch, first appearing in public with the Colonne orchestra, when she was seven years old. She appeared with leading Brit. orchestras many times between 1943 and 1949. Her interpretation of Beethoven was particularly outstanding; at her death she had estab. a reputation as the leading woman violinist of the century. Her talent could only be compared with that of Yehudi Menuhin. She was killed in an aeroplane accident in the U.S.A.

Neviansk, tn. of the Sverdlovsk Region of the R.S.F.S.R., on the Neiva R., 50 m. N.N.W. of Sverdlovsk. It is known for its metallurgical riches. Pop. 16,500.

Neville, Henry (1620-94), Eng. author, interested himself in politics. His activities displeased Cromwell, who banished him from London in 1654. He entered Parliament on the death of the Protector and sat at Westminster for some years. He was, in 1663, arrested, and acquitted, on the grounds of complicity in the Yorkshire rising. His trans. of Machiavelli's works (1675) is well known, and he was the author of many effective lampoons, including *Shuffling, Cutting, and Dealing in a Game of Piquet* (1659), being directed against Oliver Cromwell and others.

Neville, Richard, first Earl of Salisbury (1400-60), son of Ralph N., first earl of Westmorland. He acquired his title through his wife in 1429, laying claim to it on the death of his father-in-law. He was warden of the W. Marches, and as such persuaded York to lay down his arms in 1452, and when the latter gained control of the gov., during Henry VI's madness, gave him his support and was made chancellor. He was defeated by the Lancastrian forces at Ludford (1459) and fled to France, but returned in 1460 and remained in charge of London while Warwick went to meet the Lancastrians at Northampton. He was captured after the battle of Wakefield and murdered in Pontefract Castle.

Neville, Richard, see WARWICK, EARL OF.

Neville's Cross (Durham), see DAVID II.

Nevin, Ethelbert Woodbridge (1862-1901), Amer. composer, b. at Edgeworth, Pennsylvania. He studied at Berlin, Boston, and Paris, lived in France many years, but returned to America twelve months before his death. Among his works are *Water Scenes* (1898) and *The Rosary* (a song which had a tremendous vogue, 1898).

Nevinson, Christopher Richard Wynne (1889-1946), Eng. painter, etcher, and lithographer, b. in London, son of Henry Wood N. (q.v.). He studied art at St. John's School of Art, the Slade School, and in Paris. Becoming known for war paintings, his first exhibition of these being in 1916. In 1917 he was appointed an official war artist. Some of his war pictures were bought by the Imperial War Museum and the Canadian War Memorials Fund. His subjects cover a wide range, but he is concerned less with artistic effects than with emphasising his comments on life. He made use of cubist, futurist, and similar expedients in design, though less from intellectual conviction than as an experiment. Among his best works are 'The New Forest' and 'Autumn Sunshine,' both of which give the effect of depth. His etchings include 'Manor Gates,' 'Looking through Brooklyn Bridge,' 'Cornish Landscape,' 'Ebb Tide, Ryde,' 'Barmouth Estuary,' 'Steam and Steel,' and 'The King is Dead' (a pastel head). Some have been bought by the Brit. Museum, Tate Gallery, Birmingham and other city art galleries. Harvard Univ., etc. He pub. an autobiographical vol. *Paint and Prejudice* (1937).

Nevinson, Henry Wood (1856-1941), Eng. journalist, b. in Leicester and educated at Shrewsbury, Christ Church, Oxford, and Jena. He wrote 2 vols. of sketches and a *Life of Schiller* (1889) which distinguished him as a writer of rare quality. As a war correspondent for the *Daily Chronicle* in the S. African war, he shared all the horrors of the siege of Ladysmith. Meantime his *Plea of Pan* (1901) and *Between the Acts* (1903) had won him fame. A journey to Angola on commission from *Harper's Magazine* resulted in the revelations of *A Modern Slavery* (1906). He investigated the revolution in Russia, which he described in *The Dawn in Russia* (1906). He was correspondent for the *Manchester Guardian* in the First World War on the W. front, and later at the Dardanelles, Salonika, and Versailles. His *Dardanelles Campaign* (1918), together with *Essays in Freedom* (1909) and *Essays in Rebellion* (1913), will be remembered as among his finest work. He also wrote *Lines of Life* (a book of verse) (1920); *Original Sinners* (a gallery of portraits) (1920); a critical study of Goethe, 1931; *Itanning Accompaniments* (essays) (1936); and, in 1939, *Films of Time* (fantasy). His last work was a book of criticism and recollection with Thomas Hardy as the subject (pub. posthumously).

Nevis (formerly **Nevis** or **Mevis**), one of the Leeward Is., Brit. W. Indies, in the presidency (formed in 1882) of St. Kitts, Nevis, and Anguilla. It lies in 17° 14' N. and 62° 33' W., and is separated from St.

Kitts by a narrow strait. It has an area of 50 sq. m. and a pop. of 15,000. Like St. Kitts the ls. is volcanic but, unlike St. Kitts, it is to a great extent covered with volcano ashes from former eruptions; it is in fact one large mt. cone, rising to a height of 3600 ft. Sugar-growing was formerly the prin. industry, but the cultivation of Sea ls. cotton has taken its place. Coco-nuts, yams, sweet potatoes, etc., are also cultivated. The climate, for a tropical ls., is bracing and healthy, the average ann. rainfall is 53 in., and the temp. ranges between 70° and 85° F. There are practically no streams, and the water supply is derived from a catchment area high up on the mt. and stored in public reservoirs, which furnish Charlestown, the cap. (pop. 1200), and some country dists. In Charlestown, which lies on the shore of a wide-curving bay, are the remains of the house in which Alexander Hamilton, who drafted the constitution of the U.S.A., was b. (Jan. 11, 1757). The ancestral estate to the S.E. of the tn. is still known as 'Hamilton's'. The old Bath House Hotel is a conspicuous building near by and serves as a link with the past when Nevis was a fashionable health resort noted for its hot springs. The house is "solidly built that it has resisted the hurricanes of over a century." Many old writers testify to the merits of the waters from the thermal springs, including Richard Blome and the Rev. Mr. Smith, author of the *Natural History of Nevis* (1743). It was in Nevis that Nelson met and married his bride, the widow of Frances Nisbet and niece of Horbert, president of Nevis. Nelson and Mrs. Nisbet were married at Montpelier, March 11, 1787, and the record of the marriage is still to be seen in the register at Fig Tree Church. Nelson's memory is also perpetuated by Nelson's Watering-place, a creek 3 m. N. of the cap. Nevis was discovered by Columbus in 1493 and was so named by him because its cloud-capped summit resembled *nieve* or snow. The ls. was included in the grant to the earl of Carlisle in 1627 and colonised by Eng. settlers from St. Kitts in 1628. The settlement was nearly destroyed by the Spaniards the following year, and in 1706 it was laid waste by the Fr., who took away some 3000 slaves. The ls. was captured by the Fr. under the Marquis Bouillé in 1782, but was restored to England by the treaty of Versailles in 1783.

Nevis, Ben, see BEN NEVIS.

New Amsterdam: 1. Tn. of Brit. Guiana, on the Berbice, 63 m. S.E. of Georgetown. The tn. is traversed by canals. Pop. 10,000. 2. The old Dutch name for what is now New York city.

Newark, Lord, see LESLIE, DAVID.

Newark: 1. municipal and parl. bor. of England, in the co. of Nottingham, on a navigable branch of the R. Trent, 16 m. S.W. of Lincoln. The parl. church, a large and elegant edifice, though often rebuilt, still shows traces of its original Norman character. There are manufs. of machinery, and iron and brass founding, as well as a large trade in corn, malt, and cattle. There are manufs. of a

special kind of plaster. The castle of N., in which King John d. in 1216, was built early in the twelfth century. The ruins now form an attractive feature of a public pleasure ground. Pop. 22,800. 2. City and the co. seat of Licking co., Ohio, U.S.A. 33 m. E. of Columbus. It is the trade centre of an agric. region, and manufs. stoves, steel, and furnaces, bottles, glass, crockery, etc. Denison Univ. is situated here and it is a summer resort. Pop. 31,400. 3. City and port of entry of New Jersey, U.S.A., co. seat of Essex co., on N. Bay, about 8 m. W. of New York. There is a Rom. Catholic cathedral, and the city is the see of a Rom. Catholic and of a Protestant episcopal bishop; 30,000 workers are employed in nineteen assurance companies. The manuf. of shoes and other leather products, especially patent leather, became an important industry early in the nineteenth century. Other manufs. are felt hats, carriages, chairs, jewellery, clothing, brass- and iron-work, machinery, chemicals, varnish, enamelled goods, corsets, cigars, buttons, and art pottery. Thor is an airport. Pop. 429,700.

Newbattle, par. in the co. of Midlothian, comprises the vils. of Newtongrange (pop. 6000) and Easthouses (pop. 1800), principally mining. **Newbattle Abbey**, 1 m. S. of Dalkeith, was built by David I. in 1140.

New Bedford, seaport city of Bristol co., Massachusetts, U.S.A., on Buzzard's Bay, 55 m. S. of Boston. It was once the centre of the Amer. whale-fisheries. Oil refining, tanning, boot and shoe making are carried on, besides the manuf. of silk and woollen goods. It has oil and candle factories, soap factories, several cotton-mills, hoop-iron manufactures, and barrel factories. Of late years the oil business has declined, but N. B. has become one of the chief raw cotton concentration points in the E. It manufs. also cotton-spinning machinery, cotton goods, silk, and cut glass. It is a summer resort and has a textile school. Pop. 110,300.

New Bern, city and co. seat of Craven co., N. Carolina, 85 m. N.E. of Wilmington. Its chief manufs. include lumber, turpentine, and cotton goods. Pop. 11,800.

Newbery, Francis (1743-1818), Eng. publisher, was the son of John N., whose business he inherited in 1767. Subsequently the firm was N. & Harris, and in later years it was known as Griffiths & Farran. As a publisher N. did not show the acumen or industry of his father.

Newbery, John (1713-67), Eng. publisher and bookseller, b. at Waltham St. Lawrence, Staffordshire. When seventeen years old he went to Reading and procured employment in the *Mercury* offices. In 1745 he opened a publishing house in St. Paul's Churchyard; here he started newspapers, and amongst his contributors were Johnson and Goldsmith. He had often meditated a library for young people, and a venture, when made, proved a great success. The well-known books, *Goody Two Shoes* and *Tommy Trip and his Dog Growler*, may be recalled, also the *Lilliputian Magazine*. It seems

that the writers of these stories under the titles 'The Renowned Story of Giles Gingerbread' and 'Miss Margery Two Shoes' were the brothers Giles and Griffith Jones. They appeared in N.'s Juvenile Library and also in the 'Lilliputian Histories' written by the Jones brothers.

Newbold and Dunstan, see WHITTINGTON AND NEWBOLD.

Newbolt, Sir Henry John (1862-1938), Eng. barrister, author, and poet, b. at Bilton, Staffordshire, where his father was vicar. He was educated at Clifton College, Bristol, and Corpus Christi, Oxford. Called to the Bar in 1887, he practised for two years. He edited the *Monthly Review*, 1900-4. In 1892 his first book, *Taken from the Enemy* (a Napoleonic novel), was pub., and in 1895, *Morituri*, a tragedy. But his fame rests chiefly on the poems in *Admirals All* which appeared in *Longman's Magazine*, in 1897. He was knighted in 1915 and became a C.H. in 1922. He also wrote *The Island Race* (1898); *Stories from Froissart* (1900); *The Sailing of the Longships* (1902); *Songs of the Sea* (1904); *The Year of Trafalgar* (1905); *The Old Country* (1906); *Songs of the Fleet* (1906); *The Truymans* (1911); *Poems, New and Old* (1912); *Book of the Blue Sea* (1914); *Book of the Thin Red Line* (1915); *Tales of the Great War* (1916); *Book of the Happy Warrior* (1917); *Book of the Long Trail* (1919); *Book of Good Hunting* (1920); *Naval History of the War* (1920); *Studies, Green and Gray* (1926); and *New Paths on Helicon* (1927). N.'s romances had their own charm, but they were not altogether successful in challenging the conventional methods of the historical novel. His *The Year of Trafalgar* (1905) works out a convincing explanation of Nelson's and Collingwood's tactics in the battle, and, with its appendix of Trafalgar poems and ballads, made him a reputation as a naval historian as well as a naval poet. Some years later he was invited to complete the work of Sir Julian Corbett as the official naval historian of the First World War. His own unofficial naval hist. is written with more freedom. He was prof. of poetry in the Royal Society of Literature from 1911 to 1921. See W. Archer, *Poets of the Younger Generation*, 1902, and C. Kernahan, *Six Famous Living Poets*, 1922.

Newbridge, tn. in co. Kildare, Eire, on the Liffey, 4 m. N.E. of Kildare. Pop. 4000.

New Brighton: 1. Bor. of Beaver co., Pennsylvania, U.S.A., 27 m. N.W. of Pittsburgh, connected with Beaver Falls by a bridge. Its chief manufs. are flour, lumber, pottery, carriages, nails, bricks, and machinery. Pop. 10,000. 2. Tn. on Staten Is., New York city, incorporated with the bor. of Richmond in 1898. 3. Watering-place, in the co. of Cheshire, England, 4 m. N.W. of Birkenhead. Pop. 11,000.

New Britain: 1. largest is. of the Bismarck Archipelago in the Pacific Ocean, off the coast of Papua, has a mean breadth of 50 m. and is 300 m. long. It is very undeveloped except on the Gazelle

Peninsula in the N. and in the S., where there are some plantations. The interior is but little known. A mt. chain traverses the entire length of the is. and there are active volcanoes, including the peak called the Father (7500 ft.). There are some good harbours, but Simpson harbour, in Blanche Bay, is the only one visited regularly by oversea shipping. Copra is the chief product, and coffee and cocoas are also cultivated. Gasmata, on the S. coast, is a gov. station, and Rabaul (non-native pop. 4700) has a good anchorage. It was repeatedly bombed by aircraft, both Jap. and Australian, in the Second World War. The tn. was badly damaged, and in 1947 it was decided to make Kokopo, 14 m. S.E. of Rabaul, the administrative cap. in its place. N. B. was discovered by Dampier in 1699. The natives are Melanesians. Area of N. B. and adjacent ls. is about 14,600 sq. m. Pop. (indigenous) 90,000. 2. city of Hartford co., Connecticut, U.S.A., 9 m. S.W. of Hartford. Its chief manufs. are hardware, household electrical appliances, bearings, tobacco, foundry and machine shops' goods, hosiery and knitted goods, and cutlery. Pop. 69,000.

New Brunswick: 1. E. prov. of the dominion of Canada, is bounded on the N.W. by the bay of Chaleur, on the N.E. by the gulf of St. Lawrence and the strait of Northumberland, on the S. by Nova Scotia and the bay of Fundy, and on the S.W. by the state of Maine. These waters provide the prov. with a very extensive sea coast, 500 m. in extent, and indented by spacious bays, inlets, and harbours, which afford safe and commodious anchorage for shipping. The chief are Fundy, Chignecto, and Cumberland Bays, the last two being merely extensions of the first; Passamaquoddy Bay in the S. Verte, Shediac, Cocagne, Richibucto, and Miramichi Bays on the N.E., and the bay of Chaleur, 80 m. long by 27 m. broad, in the N.W. The surface is for the most part flat or undulating. With the exception of the dist. in the N.W. bordering on Canada and the R. Restigouche, no portion of N. B. is very high. The shores on the E. coast, and for 20 m. inland, are flat. The most S. point is a little S. of 45° N. lat., and its most N. a little N. of 48°. To the S.W. is a group of ls. belonging to the prov., the most important of which are Grand Manan, Campobello, and the W. Isles. The prov. of N. B. abounds in rvs. The principal are the St. John and the St. Croix, the former 450 m. and the latter 100 m. in length, and both falling into the bay of Fundy; and of the rvs. that flow eastward into the gulf of St. Lawrence are the Richibucto, the Miramichi, and the Restigouche. The prov. contains numerous lakes, one of which, Grand Lake, is 100 sq. m. in area. The soil is deep and fertile, over 950,000 ac. being agricultural, producing a variety of crops amongst which oats and barley are prominent. The fisheries are valued at about 5,000,000 dollars annually. The climate is remarkably healthy, the autumn, especially the season called the Indian summer, being

particularly agreeable. There is a wide variety of minerals, such as iron, copper, antimony, lead, zinc, tungsten, manganese, bituminous coal, and gypsum, but by no means all of these are worked, and the chief active mining in recent years has been in coal and gypsum. The most important iron deposits so far discovered are those in the Austin Brook dist. of Bathurst co. Limestone is abundant in the S. and the freestone of the prov., unsurpassed for beauty and durability,

Newburgh: 1. Royal and municipal burgh and seaport in Fifeshire, Scotland, on the firth of Tay. Its chief manuf. are linoleum and oilskin. It is also engaged in salmon fishing. Pop. 2500. 2. City in Orange co., New York, U.S.A., on the Hudson R., 60 m. N. of New York. Its chief manuf. are cotton and woollen goods, silk, paper, machinery, and flour. Pop. 31,800.

Newburn, vil. and dist. in Northumberland, England, on the Tyne, $5\frac{1}{2}$ m. N.W.



New Brunswick Government Information Bureau

A RANCH IN ALBERT COUNTY, NEW BRUNSWICK

commands a high price in the U.S.A. The value of mineral production was \$4,409,064 in 1946. Lumbering and the manuf. of wood-pulp are the leading industries, but woollen goods, machinery, sugar, and paper are also manufactured. Oil and natural gas are produced. The water-power resources of N. B. are great and it is estimated that the available and developed power is as much as 169,000 h.p. The prov. is represented in the Dominion Senate by ten members and in the Commons also by ten. N. B., together with Nova Scotia, originally formed one Fr. colony, called Acadia, or New France. It was ceded to the Eng. in 1713 and was first settled by Brit. colonists in 1764. Twenty years subsequently, in 1784, it was separated from Nova Scotia, and made an independent colony. The cap. is Fredericton (10,062); the largest tn. is St. John (51,741). Area 27,985 sq. m. (Crown lands 7,500,000 ac.). Pop. 457,400. 2. City of New Jersey, U.S.A., lies on the S. bank of the Raritan R., at the head of navigation, 15 m. from its mouth and 30 m. S.W. of New York. It manuf. cotton, leather, and machinery. Pop. 33,180.

of Newcastle. It is engaged in coal-mining and iron-founding. Pop. of urban dist. 19,900.

Newbury, municipal bor. and mrkt. tn. of Berkshire, England, on the R. Kennet. 17 m. S.W. of Reading. Close by is the hamlet of Speen, built on the site of the Rom. Spinae. The tn. has excellent shopping facilities and there are a few light industries. There is a well-known racecourse. During the Civil war the neighbourhood of N. was the scene of two battles, neither of them being decisive. During the second of these battles, Donnington Castle, resisted the Parliamentarians, being held by its governor Sir John Boys. One mile S.W. of N. on the Andover Road is a memorial to Lucius Carey, second Viscount Falkland, who fell in the first battle of N. Pop. 18,000.

Newburyport, city, port of entry, co. seat of Essex co., Massachusetts, U.S.A., on the Merrimac R., 37 m. N.N.E. of Boston. The prin. industries are the manuf. of boots, shoes, celluloid collars, cotton and woollen goods. The city has a safe harbour and a fishing industry. N. is a summer resort. Pop. 13,900.

New Caledonia, is. of the S. Pacific Ocean, belonging to France, and lying about 720 m. E.N.E. of the coast of Queensland in Australia, in lat. 20°–22°, 30° S., long. 164°–167° E. It is about 200 m. in length, 30 m. in breadth. It is of volcanic origin, is traversed in the direction of its length, from N.W. to S.E. by a range of mts., which in some cases reach the height of about 8000 ft., and is surrounded by sandbanks and coral reefs. There are secure harbours at Port Balade and Port St. Vincent, the former on the N.E., the latter on the S.W. part of the is. In the valleys the soil is fruitful, producing the coco-nut, banana, mango, breadfruit, etc. The sugar-cane is cultivated, and the vine grows wild. The coasts support considerable tracts of forest, but the mts. are barren. N. C. is rich in minerals: nickel, chrome, cobalt, silver, gold, lead, manganese, antimony, platinum, and zinc are all found in various parts. Copper has been worked in the N., and iron and lead exist in considerable quantities.

Polynesian immigrants have impressed themselves deeply on these Melanesian is. On the W. coast the negroid face and hair predominate; on the E. coast the finer features and the taller stature of the Polynesians are strikingly more apparent, while the tufts of the original negroid hair are lengthened out into curls or long undulations. The matrilineal exogamy social system has evidently yielded to a system of father-right, and tribal divs. with hereditary chieftainships. It is believed that the New Caledonians have been deeply influenced by the Maoris, who came to N. C. for the greenstone. The stone-work and petroglyphs also seem to indicate some former immigration from the E. One of the most striking things about N. C. is the swarms of children: the average family is seven or eight and a dozen is not uncommon. One of the factors in the tranquillity of the life and the contentedness of the colonists, if not also in the ample birthrate, is the excellence of the climate, especially on the E. coast where the trade winds blow most of the year. The cap. is Noumea (10,400). N. C. is administered by a governor and privy council. There is also an elective council-general of fifteen members. There is a narrow-gauge railway from Noumea to Faita (24 m.).

N. C. was discovered by Capt. Cook in 1774. In 1854 the Fr. took official possession of it and made it a convict station. Its area is 8548 sq. m., and it has a pop. of 61,250. Dependencies of N. C. are the is. of Pines, Wallis Archipelago, Futuna and Alofi, Loyalty Is., Huon Is., Bélep Archipelago, and Chesterfield Is. See J. Macmillan Brown, , 1927.

New Castle, see CASTILLA LA NUEVA.
New Castle: 1. Co. seat of Lawrence co., Pennsylvania, U.S.A., on the Shannango R., 50 m. N.W. of Pittsburgh. The region is rich in coal, iron, and other minerals, and the chief manuf.s. are tin-plate, fire-brick, flour, steel wire, glass, and iron goods. Its shipping trade is also extensive. Pop. 47,600. 2. Co. seat of

Henry co., Indiana, U.S.A., 41 m. N.E. by E. of Indianapolis. Pop. 16,600.

Newcastle, Duke of, see CAVENDISH, WILLIAM.

Newcastle, Thomas Pelham Holles, first Duke of (1693–1768), eldest son of the first Baron Pelham, assumed the name of Holles in 1711, on succeeding to the estates of his uncle, John Holles, duke of N. He was in 1715 created duke of N. He was appointed lord chamberlain in 1717, and secretary of state for the S. Dept. in 1724. Thirty years later he succeeded Pelham as Prime Minister, and in 1757 formed a coalition with Pitt, but resigned as Bute came into prominence. He was lord privy seal in Rockingham's first administration (1765–66).

Newcastle: 1. Tn. of Natal, S. Africa, near the Drakenberg Mts., about 130 m. N.W. of Pietermaritzburg. It produces coal and petroleum. Pop. (whites) 2800; (others) 4000. 2. Tn., York co., W. Australia, 52 m. N.E. of Perth. Pop. 600. 3. Or Greater Newcastle, city and port on the Hunter R., New S. Wales, 73 m. N. of Sydney. It is the largest tn. of New S. Wales outside the metropolis, and is dependent mainly on coal-mining and the iron and steel industries. Newcastle Harbour (Port Hunter) is the second port of New S. Wales and the fourth port of Australia in regard to the volume of its shipping trade. It ships coal, iron, steel, wheat, wool, and frozen meat. Newcastle is primarily a coal-loading port, and the proximity of the coalfields has led to the estab. of important industries, including the very up-to-date iron and steel works, in the dist. (a decade ago the pop. was only 12,000). The city of Greater Newcastle is 36 sq. m. in area, including the former city of Newcastle, and ten former suburban municipalities, the union of the city with the municipalities being formed on April 2, 1938. Pop. (Greater Newcastle) 127,200. 4. Tn. of New Brunswick, on the Miramichi R., close to its mouth. Pop. 3800. 5. Seaport tn. in co. Down, N. Ireland, on Dundrum Bay, 11 m. S.W. of Downpatrick. It is engaged in fishing. Pop. 2000. 6. Mkt. tn. in co. Limerick, Eire, 26 m. S.W. of Limerick. Pop. 2800.

Newcastle under Lyme, mkt. tn. and parl. and municipal bor. of Staffordshire, England, on the Lyme brook, 2 m. W. of Stoke-on-Trent. The parl. church of St. Giles has a square tower of red sand-stone dating from the twelfth century, the remainder having been rebuilt between 1873 and 1876. The tn. was formerly noted for its manuf. of hats. Now the chief industries are brewing, malting, tanning, and the manuf. of army clothing, paper, cotton, etc. Pop. 17,200.

Newcaste upon **Tyne**, city and co., and co. and parl. bor. of Northumberland, England, situated on the north bank of the R. Tyne, about 8 m. from the mouth of the riv. and the North Sea, and 272 m. north of London. The city is within the geographical co. of Northumberland, but was created a co. of itself by charter of Henry IV. in 1400. It was made a city in 1882. It is a quarter sessions bor.

and an assize tn., with a lord lieutenant appointed for the city apart from the co. of Northumberland. The chief magistrate of the city has been styled mayor since 1216; the title of lord mayor was conferred by letters patent in 1906. The area of the city is 11,401 ac. and it is divided into four parl. constituencies. There are nineteen municipal wards, each returning three councillors to the city council, and there are nineteen aldermen. The city is the seat of the bishopric of N., created in 1882 by the severance of Northumberland and N. from the anct. see of Durham. The city is connected with Gateshead on the opposite bank of the Tyne by a number of fine bridges.

N. has an interesting hist. and remains of its antiquity may still be seen. The lines of the Rom. station of *Pons Aelii*, situated on Hadrian's Wall (q.v.), are marked on the ground: many Rom. relicts are in Blackgate (the Castle) Museum. According to John Leland 'the strength and magnificence of the Waulles of this towne far passith all the Waulles of the Cities of England and most of the Townes of Europa.' Of the walls so described by Leland in 1538, the greater part has now gone. Considerable portions have, however, been preserved, though for the most part in somewhat squat surroundings. The work of building the wall, which was over 2 m. long, was begun in the latter part of the reign of Henry III. Before the Conquest the city was known as Monkchester. It owes its present name to the Norman castle built by Henry II. on the site of an older Rom. fortress. The castle belongs to the corporation, which has placed it under the charge of the N. Society of Antiquaries, whose museum of antiquities is in the Black Gate of the castle. As a port and coaling centre N. came into prominence towards the end of the fifteenth century, though coal was dug up in the reign of Edward III. According to a charter of the reign of Elizabeth, forty-eight persons were appointed to load coal here, and in 1699 200,000 chaldrons were exported. N.'s commercial prosperity is due to its position on a tidal riv. and to the large quantity of excellent coal found in the neighbourhood. The prin. docks are the Northumberland, the Albert Edward, and the Tyne. The quay (2436 yds. long), which is equipped with all mechanical appliances and communicates with Brit. Railways, forms a fine thoroughfare (Quayside) over a mile in length. It is the property of the corporation and some of the berths are of a depth of 30 ft. at low water. The banks on both sides of the Tyne are lined with wharves, factories, warehouses, and shipbuilding yards. Between the Scotswood Road, W. of the Central station, and the riv. are the Elswick shipyard, ordnance, and engineering works of Sir W. G. Armstrong, Whitworth & Company Ltd., now Vickers-Armstrong Ltd. (see also ARMSTRONG, Sir WILLIAM GEORGE, first BARON). The chief industries, apart from shipbuilding and ship repairing, are iron and steel manufactures, engineering and boiler-

making shops, locomotives, chemicals, manufactories, and lead and copper works. The exports, apart from coal, are iron and steel goods, machinery, chemicals, copper, cotton, canvas, linen, woollen and jute goods, firebricks and fireclay goods, oils, oil fuel (as cargo and bunkers), pitch, tar and resin; the chief imports are burnt ore, sulphur ore, chemicals, cement, grain, fruit and vegetables, iron manufs., iron ore, petroleum, steel manufs., and timber.

Radiating from the Grey monument—an imposing 'Rom. Doric column' surmounted by a statue of the second Earl Grey, Viscount Howick, erected in 1838—Grey Street and Grainger Street are two of the most important of the streets laid out early in the nineteenth century by Richard Grainger (1798–1861), a native of N., as part of his scheme for the development of the centre of the tn. Close to the Grey monument is Eldon Square (named after the lord chancellor) containing the city memorial to the men of N. who fell in the First World War. It is an equestrian bronze representation of St. George, the patron saint of the Northumberland Fusiliers. The Central railway station was opened by Queen Victoria in 1850. Grainger's street plan was laid out before the building of the Central station in Neville Street, and at that time the most important of the approaches to the tn. from the S. was across the old Tyne bridge or from the quay; hence Grey Street was made the widest and most imposing street in the Grainger scheme. A full-length bronze statue of George Stephenson (q.v.) by John Lough of N. stands near the station. Here too is the Wood Memorial Hall (1870).

Among the most notable of the public buildings is the cathedral dedicated to St. Nicholas of Myra and formerly the par. church of N. It is built in the Decorated and Perpendicular styles. The earliest documentary evidence of the existence of the church dates from about 1123, but though tradition has it that the church of St. Nicholas was founded by Osmond, bishop of Salisbury, in 1091, it is believed that a church stood on the site long before then. The Norman church was destroyed by fire in 1216 and was replaced by a building in the Early Eng. style. The church as it exists to-day is, apart from the tower and steeple, mainly the work of fourteenth-century builders. The Perpendicular tower and steeple were built about 1430 by Robert Rhodes, a N. lawyer, but the name of the architect is unknown. The nearly square tower is 'singularly plain and massive in design; the whole effort of the master mason who conceived it was concentrated upon leading the eye up to its crowning feature of a central pinnacle borne by flying buttresses' (Hamilton Thompson); but the design of the tower has also been severely criticised, notably by Prof. Edward Augustus Freeman (q.v.). Other churches: St. Mary's Rom. Catholic Cathedral, built in 1844 from the design of Pugin. Its tall graceful spire was added in 1872. All Saints' Church was erected in

1796 on the site of an earlier church which was demolished; the most important object which survived the demolition is the magnificent brass of Roger Thornton (*d.* 1430), who was ten times mayor of N., and Agnes his wife (*d.* 1411). St. Andrew's Church dates from the middle of the twelfth century. The church of St. John the Baptist is mainly of the fourteenth and fifteenth centuries. The W. aisle of its north transept was constructed early in the fourteenth century, the nave

Remains of the Norman wall of the castle are still to be seen, for it is certain that in early Norman times a stone wall was built which, with the mound and buildings within, constituted the castle or *castellum*; but to-day the expression 'the Castle' denotes only the keep or tower. The Black Gate is a later addition built by Henry III. about 1249. Of the S. wall more extensive remains are extant, including the Eastern Gate. The keep, which is in Castle Square, was built by



Valentine and Sons Ltd., Dundee

NEWCASTLE UPON TYNE: THE BRIDGES The Tyne bridge, the swing bridge, and the high level.

being later fourteenth-century work. On the S. wall is a memorial tablet to Richard Grainger, who was the son of a quayside porter. St. Ann's Church was built in 1768 with stones from part of the tn. wall. The church of St. Thomas & Becket was built in substitution for the old chapel of St. Thomas on Tyne bridge, which was pulled down in 1828.

The castle, which stands at the junction of Westgate Road and St. Nicholas Street, was probably called the New Castle to distinguish it from the older royal Northumbrian castle of Bamburgh, though it has been suggested that the name indicates that there was an older castle, of which nothing is known on the site, or again that 'new' was used in relation to the *Fons Aeni*. The first castle, on the site of which we have any knowledge, was that built by Robert, the son of William the Conqueror, in 1080, of which structure, however, probably nothing survives.

Henry II. between 1172 and 1177. The original appearance of the building has been altered by the erection of battlements which were added in 1810, a feature wholly alien to the style of architecture of the twelfth century. The roof of the spacious great hall of the castle is modern. The chapel of the castle is a fine example of late Norman architecture, the arches and arcading being decorated with elaborate chevron ornamentation. In the vaulted chamber known as the guard-room is a collection of interesting relics. From the roof is an extensive view of N. and Gateshead and, between them, the Tyne spanned by five bridges: the Tyne bridge, opened in 1928 by King George V., with two main piers of steel and granite and a parabolic arch of steel lattice framework rising to a height of 193 ft. above high-water mark; the swing bridge which was opened in 1876; the high-level bridge, designed by Robert

Stephenson, son of George Stephenson, and opened in 1849; King Edward VII. bridge, opened in 1906; and the Redheugh bridge, built in 1870 but reconstructed in 1900.

The gildhall on the 'Sandhill' is the anct. centre of municipal gov. of the tn. Here also were held the sittings of the local courts of record. There is evidence of the existence of a gildhall as early as the thirteenth century. The old gildhall was rebuilt and enlarged in the middle of the seventeenth century and the new building was opened in 1658, and most of the interior of the present building dates from that time. The ground floor is now a commercial exchange. The upper floor has a large hall in which the freemen of the city still hold their gild meetings, and in which the commissions of assize are opened by the circuit judges, though all cases are actually tried at the Co. Moot Hall (1810). Opposite the gildhall is the house, No. 41 Sandhill, in which Alderman Aubone Surtees lived, and from a window in which his daughter Bessie eloped in 1772 with John Scott, son of a coalfitter and merchant, who afterwards became Baron Eldon, the famous lord chancellor. In both the 'Sandhill' and the 'Sh... may be seen some interesting old Elizabethan houses.

Opening on the quayside are a number of narrow lanes called chares (from a Saxon word meaning 'to divide'). Near the top of Pilgrim Street is High Friar Street, formerly called Greyfriar Chare, the sole topographical reminder of the existence of the once famous monastery of the Grey Friars of N. Duns Scotus is said to have been a brother at this monastery. In Northumberland Street or vicinity are many public buildings, including the Mansion House of the city, and the new city hall and baths opened in 1928. At the top of this street is the site of the Barras bridge (a small bridge over a small stream), probably a corruption of the word 'bars' or 'barriers' indicating that here were the barriers of the tn. Here is the traditional site of the long-drawn-out single combat (1388) between Harry Hotspur and the earl of Douglas before the battle of Otterburn. The Hancock Museum of Natural Hist. in Barras Bridge, opened in 1884, is a fine building containing the collections of the Natural Hist. Society of N., Northumberland, and Durham. In the galleries is a large series of the original work of Thomas Bewick (1753-1828), the famous wood engraver, who was b. near N. There are colleges of medicine and science belonging to the univ. of Durham, the Rutherford College and Commercial Institute, and the Royal Free Grammar School (1525). The King's College was founded in 1871 as Armstrong College, the title being changed in 1937. The main block of buildings was opened by King Edward VII. in 1906. Among the scholars of the grammar school were Adm. Lord Collingwood, Lord Eldon, Lord Stowell, and Mark Akenhead. The old school buildings were demolished in 1844, the new buildings in Jesmond being occupied in 1906. The

Central Public Library contains over 90,000 vols., apart from MSS. Behind the library is the Laing Art Gallery containing a permanent collection of Brit. water-colour drawings dating from the late seventeenth century.

The chief residential suburb is Jesmond (Jesus Mt.). There are a number of parks and recreation grounds, including Jesmond Dene, Brandling, Armstrong, and Heaton Parks, the Town Moor and Castle Leazes. Among the societies founded in N. are the Tyneside Naturalists' Club (1846), the North of England Institute of Mining Engineers (1852), the N. Society of Antiquaries, and the Fine Arts Society. Pop. (estimated 1949), 290,400. See J. Brand, *History and Antiquities of Newcastle*, 1789, and F. A. Wille (ed.), *The City of Newcastle upon Tyne*, 1949.

Newchwang, Nuishwang, or Yingkow, treaty port in S. Manchuria, China. The tn. proper stands on the Liao R., 40 m. from the coast, but the name is usually applied to the port, 30 m. nearer the coast of the gulf of Laotung, which was originally called Muh-kow-ying. The Liao R. is here about $\frac{1}{2}$ m. wide, but the port is ice-bound in winter. The surrounding country is flat and marshy. The chief industry is the manuf. of bean oil and bean cake which form the chief exports, with raw beans, ginseng, and raw silk. There are gold, iron, and silver mines. The U.S.A. and Great Britain abrogated their extra-territorial rights in 1943. Pop. 106,000.

New College, Oxford, founded by Wm. of Wykeham in 1379 as the college of St. Mary of Winchester, the other title arising from the existence of St. Mary's College. The fine buildings still retain much of the founder's design, and are notable for the chapel containing his pastoral staff, also for the cloisters (consecrated in 1400), and the massive detached tower. New buildings have been added. The lovely grounds contain portions of the old city wall. The original link with Winchester is maintained by the reservation of five scholarships to boys from Winchester College. Five fellowships are known as Wykeham professorships.

New Columbia, see WRANGEL ISLAND.

Newcomb, Simon (1835-1909), Amer. astronomer, b. in Nova Scotia. In 1859 he was appointed prof. of mathematics to the U.S. Navy, and later astronomer at the naval observatory, Washington, where he superintended the erection of the 26-in. equatorial telescope. From 1871 to 1874 he was secretary to the U.S. commission for observing the transit of Venus, and in 1882 observed the same at the Cape of Good Hope. From 1881 to 1893 he was prof. of mathematics and astronomy to Johns Hopkins Univ. He interested himself in the eclipses recorded by Ptolemy in the *Almagest*, and by the Arabian and later astronomers to the eighteenth century. N. studied chiefly the problems of gravitational astronomy. He wrote numerous books on astronomy and sociology, *Popular Astronomy* (1878) having a wide circulation. His *Reminiscences of an Astronomer* was pub. in 1903.

Newcomen, Thomas (1663-1729), Eng. inventor of the atmospheric steam-engine, b. at Dartmouth. In 1705, together with Savery and John Calley, he took out a patent for a 'fire-engine' notable for its safety and economy. The engine of James Watt improved upon this by the use of a separate condenser. In 1723 he set up an engine for drawing water at Griff, near Coventry.

New Deal policy adopted by President Franklin Roosevelt in 1933 to overcome the crisis which threatened the collapse of the economic system of the U.S.A. Up to the time of the N. D. the states were presumed to have jurisdiction over almost all matters of a social character; thus the hours and wages of labour, the conditions of factory work, the welfare of women and children, education, etc., were all matters of state, not federal, concern. The N. D. changed this, but it required a national catastrophe to justify, and a bold administration to attempt, the change; and it was carried out only over the determined opposition of the supreme court. The N. D. legislation, which President Roosevelt's administration introduced, consisted partly of measures for recovery and relief, partly of measures for reform. It comprised a series of far-reaching economic and social measures, which reversed previous attempts to end the depression by ordinary deflationary means, and it was largely designed by a body of profs. and other expert advisers (nicknamed the 'Brain Trust') in 1932. The starting-point was the National Industrial Recovery Act of 1933, which, together with its agric. corollary, the Agricultural Adjustment Act (providing for large-scale assistance to farmers), placed control of industry and agriculture in the hands of the President. It set up a generous programme of expenditure on public works, so as to stimulate business and provide employment; aims which were helped by devaluation of the dollar by 40 per cent, and by the formation of the Reconstruction Finance Corporation, which granted the necessary loans, and by the abandonment of the gold standard. It inaugurated a comprehensive programme for the conservation of natural resources, one of the chief instruments of which was the Civilian Construction Corps, which gave work to some 3,000,000 young men. It set up elaborate systems of unemployment relief, and, by 1940, some sixteen billion dollars had been spent on direct relief and seven billion on public works. Workers were encouraged to form trade unions by the Wagner Labor Relations Act, 1935, which Act, with the Fair Labor Standards Act, 1938 (designed to provide reasonable hours and wages), were improvements on the labour provisions of the National Industrial Recovery Act of 1933, which latter Act had been voided by the court in 1935. A scheme of social insurance was introduced by the Social Security Act. The Banking Act and the Securities Exchange Commission placed financial control in the hands of the administration, thereby breaking the power of Wall Street. The N. D.

raised taxes on the incomes of the rich and of corporations. It set up the highly successful Tennessee Valley Authority to develop the resources of one of the great interior basins of the country through the use of state-owned hydro-electric dams. In the field of labour, the N. D. enacted a series of epoch-making laws; while among reforms in administration was the Hatch Act, which wa^s directed against 'pernicious political activities' on the part of gov. employees and the corruption and extravagance of political parties. Essential parts of the National Industrial Recovery Act were declared invalid by the supreme court on May 27, 1935, and part of the Agricultural Adjustment Act on Jan. 6, 1936, but the chief economic institutions inaugurated on the basis of those Acts remained in existence and exerted a considerable influence on Amer. developments. The N. D. policies did not end unemployment, but certainly reduced the numbers (17,000,000) by anything up to 10,000,000.

To many contemporaries the N. D. seemed like a revolution, but in reality it was conservative in the same sense that the democratic policy of Jefferson and Wilson had been conservative. Its aim was to protect, against violation from the left or the right, the essentials of Amer. democracy, namely, the balance of interests under the constitution and security for property and for men. If in its philosophy the N. D. was democratic, in method it was evolutionary. 'Because for fifteen years legislative reforms had been dammed up, they now burst upon the country with what seemed like violence, but when the waters subsided it was clear that they ran in familiar channels (Nevins and Commager). The conservation policy of the N. D. had been begun by Theodore Roosevelt; railroad and trust regulation was initiated some fifty years earlier; banking and currency reforms had been advocated by Bryan and, to some extent, achieved by Wilson; farm relief programme owed much to the Populist party of the nineties; while in the sphere of international relations its policies were really continuations of the traditional policies of strengthening national security, maintaining the freedom of the seas, supporting law and peace, and championing democracy in the W. world. See A. M. Bingham, *Challenge to the New Deal*, 1934; T. E. Dewey, *The Case Against the New Deal*, 1940; J. T. Adams, *The Epic of America*, 1940 ed.; A. Nevins and H. S. Commager, *America: the Story of a Free People*, 1942; and Frances Perkins, *The Roosevelt I knew*, 1947.

Newdigate, Sir Roger, fifth Baronet (1719-1806). Eng. antiquary, was a collector of antq. marbles, vases, and books. He is, however, now principally remembered as the founder of the N. prize for Eng. verse at Oxford.

New Economic Plan, see RUSSIA, *History*.
New England, collective name applied to the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Is., and Connecticut, in the N.E. of the U.S.A. Area 61,976 sq. m. The coasts were

explored by Sir Humphrey Gilbert in 1583, and the dist. in 1614 by Capt. John Smith, who suggested the name.

New English, see under ENGLISH LANGUAGE, Old English.

New European Order, see NEW ORDER.

New Forest, name of a dist. in Hampshire (*q.v.*), triangular in shape, and bounded on the W. by the R. Avon, on the S. by the coast, and on the N.E. by a line running from the borders of Wiltshire along Southampton Water. Area about 145 sq. m. This triangle appears to have been a great wooded dist. from the earliest times and its present name dates from the Norman Conquest, when it was regularly afforested. Since that period it has remained a possession of the Crown. The prin. trees in the forest are the oak and beech, with large patches of holly as underwood. The oaks have been much used as timber for the Brit. Navy. The afforestation of this dist. by the Conqueror, enforced by savage forest laws, was regarded as an act of the greatest cruelty, and the violent deaths met by both of his sons, Richard and Win. Rufus, both of whom d. from arrow wounds in the forest, were looked upon as judgments of Providence. A small breed of pony ^{was} wild under its shelter. Among the places of interest in the forest are the vll. of Minstead, and its church with a three-tiered pulpit and two galleries; Lyndhurst (*q.v.*) and its Verderers Hall; Wilverley Post, with fire watch-tower; Winchelsea Moor; Brockenhurst; and Beaulieu, with its ruined abbey of King John's time. Under a Bill introduced in the House of Lords at the end of 1948 the verderers may authorise, on terms, the enclosure by the Forestry commissioners of up to 5000 ac. of forest land for the growth of timber; and also the enclosure, temporarily, of the ant. and ornamental woods so as to secure their preservation for regeneration. The verderers may also agree with the Ministry of Agriculture for the enclosure of up to 3000 ac. for cultivation and the improvement of grazing. Finally, the Bill provides for the reconstitution of the Court of Verderers. Of the ten verderers one will be the official verderer, five will be elective, and four will be appointed by the Ministry of Agriculture, the Forestry Commissioners, the local planning authority, and an amenity preservation society to be designated. The Bill extends the purposes for which the verderers may make or alter by-laws. See J. R. Wiso, *The New Forest, its History and Scenery*, 1883; R. L. P. Jowitt, *Hampshire*, 1949; and B. Vesey-Fitzgerald, *Hampshire and the Isle of Wight*, 1949.

New Forest Pony, see under HORSE.

Newfoundland, is. prov. of Canada, formerly a Brit. dominion, situated between $46^{\circ} 37'$ and $51^{\circ} 39'$ N. lat., and $52^{\circ} 35'$ and $59^{\circ} 25'$ W. long., on the N.E. side of the gulf of St. Lawrence, the greatest length from N. to S. is 350 m., and average breadth about 130 m. Its estimated area is 42,734 sq. m. and pop. at the last census 318,177 (including Labrador). In

shape it resembles an equilateral triangle, of which Cape Bauld on the N., Cape Race on the S.E., and Cape Ray on the S.W. form the angles. By the decision, on March 1, 1927, of the Judicial Committee of the Privy Council, the Atlantic watershed of the Labrador peninsula, including the basin of the Hamilton, was awarded to Newfoundland (see LABRADOR). The remainder of the Labrador peninsula forms part of Quebec prov. The boundary was fixed as follows: A line drawn due N. from the E. boundary of the bay of Anse Sablon as far as 52° N. lat., thence W. up to the Romaine R., and then N. along the l. b. of that riv. and its head waters to their source, thence due N. to the crest of the watershed, and thence W. and N. along the crest of the watershed of the rivs. flowing into the Atlantic until it reaches Cape Chidley, at the entrance to Hudson Strait. The ls., as seen from the sea, presents a wild and sterile appearance. Its surface is diversified by mts., marshes, barrens, ponds, and lakes. The mts. in the Avalon Peninsula (stretching S.E. from the main portion of the ls., and connected with it by an isthmus of only about 3 m. in width) rise, in some cases, to 1400 ft. above sea level; and along the W. shore the height of 2500 ft. is frequently reached. The number of lakes is remarkable, and it has been estimated, though perhaps with some exaggeration, that about one-third of the whole surface is covered with fresh water. The 'barrens' occupy the tops of hills. The coast-line is everywhere deeply indented with bays and estuaries affording safe harbours. Of these inlets the prin., beginning from the N. extremity of the ls., are Hare, White, Notre Dame, Bonavista, Fortune, St. Mary's, Placentia, St. George's, and St. John's Bays. The rivs., none of which are navigable for any distance, link the lakes of the interior with the shore, and are narrow and winding; occasionally they are used to drive machinery. The main streams are the Exploit, with its trib. the Great Rattling, and the Humber. The soil is sterile and unproductive, although there is considerable cultivation along the seaboard of the settled dists. As regards the strip of Labrador assigned to Newfoundland in 1927, the outside coast-line is bleak, but the shores of the bay and rivs. are well wooded, and in some cases densely so, the timber being high and sound. The temp. of the interior is similar to that of N. Canada.

There are in Newfoundland about 4000 permanent inhab. (1300 Eskimos, the remainder being of Brit. descent), occupied in the fisheries and in trapping. The pop. is greatly increased in summer by fishermen and sportsmen. The Newfoundland cod fishery is world famous and has been the mainstay of the ls. since first it became permanently settled. Salmon, halibut, lobster, herring, caplin, and seal are also caught. The whale fishing has declined. Battle Harbour (strait of Belle Isle) is the chief port. The chief exports consist of dried cod (10,000,000 lb. in 1940), halibut (396,000 lb.),

pickled herring (7,500,000 lb.), lobsters (2,440,000 lb.), salmon (3,440,000 lb.), iron, fish oils, zinc and lead and copper concentrates, sealskins, and pulpwood. The chief export to the United Kingdom and the U.S.A. is paper; to Canada, iron ore. The total value of exports, 1946-47, was \$62,427,305. Great beds of hematite iron ore have been found at Bell Is., Conception Bay, and large quantities are being exported. Buchan's Mine, Red Indian Lake, produces lead and zinc concentrates. Copper is worked in Notre Dame Bay, coal is known to exist in St. George's Bay and in the Grand Lake dist. and silver, nickel, chromium, antimony, asbestos, and vanadium are also found, but they have not yet been shown to be commercially workable. Over 20,000 tons of fluorspar were exported in 1946. The estab. of large and well-equipped paper mills at Grand Falls by the Anglo-Newfoundland Development Company opened up a very large industry. This company also operates a large mill at Bishop's Falls. The paper is shipped to the United Kingdom and used in the prin. London printing offices. A model tns. has been laid out with all necessary public utility services. Botwood is the prin. port for summer shipments from the Grand Falls mills. There are also large paper and pulp mills at Corner Brook. These were formerly owned and operated by the International Power and Paper Company, but were taken over by a subsidiary of the Bowater's Paper Mills. The total export of newsprint in 1938 was 268,000 tons, and of pulpwood 99,000 cords. Local secondary industries carried on at St. John's and outposts include aerated waters, breweries, boots and shoes, leather, and mattresses. By the Education Act, 1927, the central administration is vested in the Bureau of Education, presided over by the Prime Minister. A general training school for teachers was opened in 1921, and in 1925 the Newfoundland Memorial Univ. College was opened. Chief tns. St. John's (cap.), 56,700; Bell Is., 7020; Corner Brook, 5400; Grand Falls, 4500; Bonavista, 4200; Carbonear, 3400; Twillingate, 3400, and Harbour Grace, 2300.

History.—The early hist. of Newfoundland is obscure. It was discovered June 24, 1197, by John Cabot. It was visited by the Portuguese navigator, Gaspar de Cortereal, in 1500, and within two years regular fisheries had been estab. on its shores by the Portuguese, Biscayans, and Fr. Sir Humphrey Gilbert, with his ill-fated expedition, arrived in St. John's harbour, Aug. 1583, and formally took possession of the is. in the name of Queen Elizabeth. On the return voyage the expedition was scattered by a storm, and the commander lost. The hist. of the is. during the seventeenth and part of the eighteenth centuries is little more than a record of rivalries and feuds between the Eng. and Fr. fishermen; but by the treaty of Utrecht (1713) the is. was ceded wholly to England. A representative assembly was created in Newfoundland in 1832. In 1846 a terrible fire destroyed half the cap.,

a hurricane overwhelmed a large number of fishing craft, and the potato crop failed through blight. In 1855 the is. was given responsible government. In 1860 the fishery partly failed, a reminder that Newfoundland depended primarily on the bounty of nature, and this period of adversity only ended in 1869. Two years previously Newfoundland seemed to be enthusiastic for membership of the Canadian Confederation and provision to that effect was actually made in the draft of the British North America Act. Opposition to the Federal party in Newfoundland, however, resulted in the is. refusing to join, the reasons being a fear of Canadian dominance, the is.'s interest as a fish producer, and the vagueness of the terms offered. In 1880 the first Railway Bill was passed for the construction of a light railway from the cap. to Hall's Bay, and by 1884 the line was completed as far as Harbour Grace, but it was not until 1891 that it was extended to Trinity and Bonavista Bays. In the eighties there were difficulties with the U.S.A. over fishing rights in Brit. N. Amer. waters and the ensuing negotiations resulted in a treaty which provided for delimitation; but it was only in 1912 that this question was finally settled by a new treat. Meanwhile Amer. fishing vessels had been given, as from 1888, the right to facilities and amenities by ann. licence at a fee of \$1.50 a ton. In 1894 the banks failed owing to the failure of customers to realise on their catches of fish, and one effect of this crisis was to expose the weakness of the credit system on which the fishing industry was conducted, and the distrust engendered in the confused conditions of this period has never been wholly dispelled, while the effect on the morale of the people was both deep and permanent. In this period of economic adversity Newfoundland sought admission to the Dominion of Canada (see also *Federal Union with Canada* below).

The period from 1890 to 1914 was one of abundant promise, marred at first by a lack of statesmanship which nearly prejudiced the future of the is., and in its final stages by a programme of public expenditure which, if well intentioned, was economically unsound. Long previously the is.'s gov. should have realised the disadvantages resulting from dependence on a single industry, the fisheries. With the estab. of the Anglo-Newfoundland Development Company's pulp mill at Grand Falls, the development of the iron-ore mine at Bell Is., the completion of the railway, and the opening up of the W. coast to settlement, it was felt that Newfoundland had gone far towards freeing itself from complete dependence on the fishery, but this could only be the case if the price of the chief fish, the cod, remained high in the world's markets. After the First World War an illusory prosperity from the high price of cod was to prove the undoing of the is.'s whole economy when the world depression of the 1930's hit Newfoundland. Newfoundland had lived beyond its means and continued to do so in spite of the fall in the price of

its fish. Furthermore the natural resources of the is. had been recklessly dissipated, the land mostly being held for speculative purposes instead of being developed. Moreover there were political malpractices, and it was the rule rather than the exception that members of an administration and their supporters obtained what benefits they could during their party's tenure of office. Hence the budget remained unbalanced for twelve successive years, and the interest charges on the public debt amounted to over 50 per cent of the average ann. revenue, there being no provision for a sinking fund.

The Brit. Gov. then appointed a commission of gov. of six (three from the United Kingdom and three from Newfoundland) under the chairmanship of the governor, and this new form of government assumed office on Feb. 16, 1934, and was still in being, albeit with changes in personnel, when the Second World War broke out.

The loyalty of the Newfoundlanders is proverbial. They are exclusively Brit. and native born, and the overwhelming majority are of Eng. or Irish descent, and not more than three or four generations removed from those born in the mother



NEWFOUNDLAND: DRYING COD IN WITLESS BAY

E.N.A.

In 1928 Newfoundland was rapidly approaching insolvency, but there was no change in policy and further external loans were raised in 1928, 1929, and 1930. There was in fact a continuance of mis-government which only served to increase the burden on the fisherman and on the poorer members of the community (see the report of the Amulree Royal Commission, 1933). This commission was sent out to investigate the financial situation. Its report recommended that the existing form of government should be suspended and that a special commission of government should be formed with full legislative and executive authority, subject to the supervisory control of the Imperial Gov. in London. In fact, the Brit. Gov. assumed responsibility for the is.'s finances until such time as Newfoundland might again become self-supporting.

country. The call of Britain's danger has always stirred the blood of the fishermen and lumbermen of Newfoundland. The outstanding seamanship of their fishermen has long been known in the R.N., and the special branch of the R.N.R., recruited exclusively from the is. seamen, was formed at the beginning of this century. Newfoundlanders were present at the historic exploit of the *Vindictive* at Zeebrugge and at Suvla Bay in the First World War. On the W. front in that war they fought at Beaumont-Hamel, Monchy-le-Preux, and Ypres. At Beaumont-Hamel—where there is a memorial to them—on July 1, 1916, they went into action 753 strong, but next day only sixty-eight answered the roll-call. In the Second World War men were recruited for heavy artillery brigades, for the Newfoundland Regiment, and as air pilots.

Owing to wartime employment revenue became more buoyant, but the surplus of \$2,250,000 owed something to the suspension of expenditure on the gov.'s plan for rural reconstruction.

In the Second World War some 7000 men joined the Brit. forces, in addition to 1000 enlisted in other dominion contingents and 3600 who served as lumberjacks in the forestry unit in Great Britain. Many of the islanders enlisted in brigades of heavy artillery, rendering distinguished service. Facilities for the estab., use, and protection of naval and air bases on the Avalon Peninsula and on the S. coast of Newfoundland were granted to the gov. of the U.S.A. in Sept. 1940. Under an agreement made in May 1946 between the govs. of Canada, Newfoundland, and the United Kingdom respecting defence installations constructed in the is. during the war, Canada gave back the control and operation of the airport at Gander and the seaplane bases at Glynneagle and Botwood to Newfoundland, and with a view to facilitating the development of the Gander airport as a civil airport, Canada gave up its rights under the lease granted in 1941. In consideration of taking over all the buildings, hangars, and works constructed by Canada at Gander the Newfoundland Gov. agreed to pay by instalments the sum of \$1,000,000. Under the same agreement the title to the lands of Torbay airport, in accordance with the understanding between the two govs. at the time that airport was constructed, was vested in the gov. of Canada for operation as a commercial airport for the air service between Newfoundland and Canada, but with equal facilities to the civil and military aircraft of both countries. The last article of this agreement provided for joint consultation between all three parties to the agreement on the co-ordination of defence requirements in the is. Canadian and United Kingdom military aircraft have the right to fly over Newfoundland and use its airports without payment of landing fees.

Federal Union with Canada.—In 1947 representatives of the Canadian Gov. and of the Newfoundland National Gov. met at Ottawa to determine whether an equitable basis could be found for federal union between the two countries. During the war, in July 1943, Mr. Mackenzie King (*q.v.*) in the Canadian House of Commons stated that his gov. would give sympathetic consideration to any request by Newfoundland for incorporation in the dominion. The door was thus reopened for consideration of an old and difficult controversy, perhaps under more hopeful auspices than on previous occasions. In 1864 Newfoundland had been invited to join the provs. of Brit. N. America, which, in view of their strategic situation during the Amer. civil war, were then contemplating the federal union that subsequently evolved into the dominion of Canada; but after attending the preliminary negotiations Newfoundland withdrew. Thirty years later (1894) the position was reversed. Canada was advancing in pop.

and wealth, whereas Newfoundland was insolvent; and a delegation went to Ottawa to discuss the possibility of terms of admission; but when Canada was asked to assume the whole public debt of Newfoundland, which was then standing at \$16,000,000, the negotiations again broke down. Thirty years later still the position was again reversed following the Privy Council award in 1927 to Newfoundland of a large strip of Labrador. Newfoundland thus technically became a continental power and Canada suggested union, but this time Newfoundland objected. Within ten years the is. was again insolvent, as shown earlier in this article. From 1934 Newfoundland was administered by a commission appointed from London and under this body the economic position improved, but politically it could hardly be more than an interim solution and the time therefore seemed opportune for a renewal of the discussion. The public debt had by 1943 increased from \$16,000,000 to \$100,000,000, but what was an insuperable objection in 1894 appeared less in proportion to the dominion of 1943, while on the other hand the potential resources of Newfoundland in timber, fish, and minerals are considerable, and while their development may be beyond the power of the 300,000 islanders the support of the great dominion may well remedy that difficulty within a few years.

Question of the Status of Newfoundland.—From 1941 there was a decided change in the employment situation and this was reflected in the revenue returns, which showed a surplus for the first time for many years, the surplus in 1943 & being nearly \$10,000,000 on a revenue of \$28,601,000. This change was not due to any industrial revival but merely because of the Allies' use of the strategical advantages of Newfoundland as a defence base, which meant remunerative work in almost every class of employment. It was realised that this prosperity was transitory, though it had not ended in 1947-48 when the estimated revenue of \$35,702,500 was higher than in any year excepting 1946-47, basic industries operating to capacity, while there was still full employment at the airports and the Amer. bases. In these circumstances a movement was started to urge the redemption of the pledge made by Britain in 1934 that, when the is. was again self-supporting, the former constitution would be restored. To ascertain whether Newfoundland was restored to a self-supporting basis and what form of gov. the people desired, the Brit. Gov. in Oct. 1946 set up an elected National Convention of forty-five members to make recommendations on possible future forms of gov. which should be placed before the people in a referendum. The Convention was in session for fifteen months and cost over a million dollars. It was interested at first in two things only, the restoration of responsible gov. or the retention of commission gov. The deliberations were protracted by reason of the fact that in the meantime the question of union with Canada was under discussion be-

tween the Canadian Gov. and a delegation who went to Ottawa to ascertain what fair and equitable basis might exist for federal union with Canada. Three months later the delegation returned with terms which seemed adequate and even generous; but there were fears in Newfoundland about income tax and Canadian competition in trade. The anti-Confederates suggested that the terms had not been negotiated (the members of the Convention were ordinary citizens and in most cases lacked the knowledge necessary to deal with involved financial and economic matters) and that in any case terms should only be discussed by a properly constituted Newfoundland Gov. In its final vote (Jan. 28, 1948) the Convention decided by twenty-nine votes to sixteen that union with Canada should not be recommended as a possible choice. Instead the Convention recommended two choices only for the ballot paper, the continuation of commission gov. and the return of responsible gov. But the Convention did not have the last word. It merely made recommendations to the Brit. Gov. and the latter decided that three choices should be placed before the people, including union with Canada, included because there was a substantial minority in the Convention in favour of considering it. There were manifest advantages in joining Canada, including substantial financial grants and social service benefits. The result of the first referendum showed over 60,000 votes each for confederation with Canada and a return to responsible gov. and only 22,000 for the retention of gov. by commission. As none of the three choices secured a vote greater than the combined total of the other two a second referendum was thought to be necessary. But on July 22 a referendum was held only as between a return to responsible gov. and union with Canada. At this referendum a clear vote was secured in favour of Canadian confederation, despite much bitter feeling among a large section of Newfoundlanders. It then only remained for Newfoundland representatives to negotiate with the Canadian Gov. for the final terms of union for submission to the Canadian Parliament, with whom the final decision rested.

The terms of the agreement for taking Newfoundland into the Canadian confederation were signed in Ottawa on Dec. 11, 1948, by representatives of the Canadian Gov. and the Newfoundland delegation, the operative date for union being March 31, 1949, subject to the approval of the terms by the Canadian Parliament and the Newfoundland Gov. The Canadian Commons having passed the necessary resolution, and the Newfoundland Gov. also assenting to the terms, the Brit. Gov., in accordance with the joint request of Canada and Newfoundland, gave its assent to union by an Act of Parliament confirming the agreement. Under the agreement the services taken over by the dominion gov., thereby relieving the new prov. (now the tenth prov. of Canada) of the public costs incurred in respect of them after they had

been taken over, were: the Newfoundland railway, including some shipping and other marine services; the Newfoundland Hotel; telegraphic services; civil aviation; customs and excise; defence; protection of fisheries; geological, topographical, geodetic, and hydrographic surveys; lighthouses, buoys, and beacons; radio broadcasting system; and some other public services.

See H. J. Hatton and M. Harvey, *Newfoundland: England's Oldest Colony*, 1897; J. G. Millais, *Newfoundland and its Untrodden Ways*, 1907; W. G. Gosling, *Life of Sir Humphrey Gilbert*, 1911; C. Seitz, *Newfoundland, the Great Island*, 1927; J. L. Smallwood, *The New Newfoundland*, 1931, and (ed.), *The Book of Newfoundland* (2 vols.), 1936; T. Lodge, *Dictatorship in Newfoundland*, 1939; A. H. McLintock, *The Establishment of Constitutional Government in Newfoundland, 1783-1832*, 1941; T. G. Taylor, *Newfoundland: a Study of Settlement*, 1946; and R. A. McKay (ed.), *Studies on the History and Economy of Newfoundland*, 1946. See also Report of Royal Commission (Cmnd. 4480), 1933, and Annual Reports by the Commission of Government, 1934-38. On Labrador see W. G. Gosling, *Labrador*, 1910; S. K. Hutton, *Among the Eskimos of Labrador*, 1912; and Sir W. T. Grenfell, *Vikings of To-day*, 1898; *Labrador*, 1922, and *The Romance of Labrador*, 1934.

Newfoundland Dog. Few breeds of dog are associated with so many accounts of cauina instinct, devotion, and sagacity as the N. D., which was introduced, probably in the late eighteenth century, from Brit. N. America, where it had been accustomed to a very hard life on rough



T. Fall

NEWFOUNDLAND DOG

fare, and had long been bred for intelligence and taught to take to water without hesitation. It is in fact unrivalled as a water dog, and is much assisted by the oily nature of its dense, straight coat and by its partly webbed feet. Newfoundlanders of the time when Sir Edwin Landseer immortalised the breed by his painting, 'A Distinguished Member of the Humane Society,' were of various colours. But there are now two established varieties, the black and the white and black. Other colours, such as bronze or red and white

are not favoured. In both varieties the head is broad and massive, with short and square muzzle, small ears, and small deep-set eyes without haws. The back is broad, neck strong and short, legs very strong, and the feet large and round. The chest is deep and broad, and the tail thick and long enough to reach just below the hock. The general appearance is that of a dog of great strength and activity for its build and size. The movement is free, and the loose swinging of the body between the legs, giving a slight roll to the gait, is characteristic. According to the Newfoundland Club's standard, the weight should not be less than 110 lb. for a bitch and not more than 140 lb. for a dog, while the average height is put at 25 to 27 in. respectively, but considerably larger animals are not uncommon. Newfoundland puppies need plenty of lean meat, both raw and cooked, as soon as they are able to take it, and they must have regular and frequent exercise.

Newgate Prison, former prison in London, situated at the W. end of Newgate Street, opposite the Old Bailey. It was begun in the reign of Henry I., and is mentioned as a prison in 1207. In 1241 a sum of 20,000 marks was exacted from wealthy Jews of London to repair the structure. In the fifteenth century funds for its rebuilding were left by the will of Sir Richard Whittington. It was destroyed in the Great Fire of 1666, but rebuilt about 1770. It suffered much damage by fire during the No-Popery riots of 1780, when 300 prisoners were let loose (see Dickens's *Barnaby Rudge*). Mrs. Fry began her labours for the improvement of the condition of prisoners there in 1808, and it ceased to be used as a debtors' prison in 1815 and as a place of incarceration in 1877. Executions took place within it after 1868. In 1904 it was demolished, and the site is now occupied by the Central Criminal Court. The noted prisoners who have been confined in it include John Wilkes, Daniel Defoe, Jack Sheppard, Titus Oates, and Wm. Penn.

New Georgia Archipelago (Pacific Ocean), see SOLOMON ISLANDS.

New Glasgow, tn. of Pictou co., Nova Scotia, Canada, on East R., 10 m. S.E. of the seaport of Pictou. There is an important shipbuilding industry, rolling and steel plate works, car works, potteries, and saw mills. Coal-mines are worked in the neighbourhood, and agriculture is carried on. Pop. 9210.

New Granada, see COLOMBIA.

New Guinea, large island (the next in size to Australia) in the E. archipelago, lying N. of Australia and separated from it by the Amatonga Sea and Torres Straits (80 m. wide). Length (E. to W.) about 1500 m.; breadth 30 to 430 m.; area about 300,000 sq. m. It is divided politically between Great Britain (the S.E. or Papua, and the N.E. mandated ter. of N.G.), Holland (W.), and Germany until it was taken by an Australian force for Great Britain in Sept. 1914. It is now held under a mandate by the Commonwealth of Australia (for the S.E. see PAPUA). The

is. is very irregular in shape, the coast being indented by numerous deep bays, such as Geelvink Bay. The coast is mountainous and rocky in the N. but low and marshy in the S.W., and large numbers of small is. lie off it. The interior is still little known, but is very mountainous, rising in the Charles Louis Mts. to over 18,700 ft. Mt. Trafalgar is an active volcano. The chief riva. are the Baxter, Philip, Aird, Aivel, Kaiserin Augusta, and Amerno, sev. of which are navigable. The climate is hot and humid in the lowlands, where fever is very prevalent, but comparatively healthy at an elevation of 3000 ft. The rainfall is very heavy, reaching 150 in. in parts. The vegetation is dense and luxurious, mainly resembling that of the Malay Archipelago, with some Australian types. Fruit and spices are also abundant. The animals are few, mainly marsupials, but birds are abundant. The natives, classed as Papuan Negroes, have a considerable admixture of Malayan and Polynesian blood, and belong to the Melanesian div. They are usually medium or small in stature, with narrow head and slight chin. Some of the inland tribes are very savage and addicted to cannibalism. The is. was discovered by a Portuguese, De Abrea, in 1511, and named Papua by De Mencis in 1526 and N. G. by De Ortez in 1545. The Dutch annexed some parts of the W. coast in the eighteenth century; in 1793 the E. India Company formally annexed the is. In 1848 Holland annexed the country W. of 141° E.; in 1885 Germany estab. a protectorate in the N.E. In 1883 the E. was annexed by Queensland, and the action of Germany forced Great Britain to proclaim a protectorate over the S.E. This was made a crown colony in 1888. In 1893 a boundary treaty was concluded in accordance with which the Brit.-Dutch boundary runs from the mouth of the Bensbach, N. to the Fly, and along it to 141° E. The boundary between Papua and the mandated ter. runs from 5° S. in 141° E. to 6° S. in 144° E., thence to 80° S. In 147° E., thence along 80° S. Dutch N. G. has an area of 152,000 sq. m. and a pop. of over 200,000. Chief port, Doreh. The mandated ter. of N. G. (including the adjacent is.) has an area of 91,000 sq. m. This mandated section is the most developed part, but in 1938 there were only 547 white settlers, and these were cultivating some 250,000 ac. or only 0.4 per cent of the total area. In 1940 the area under cultivation was returned at 11,000 hectares. Pop. (white) 4000, (native) 669,000 (including 39,000 indentured labourers). Civilisation is practically confined to the coasts; the interior is mountainous, little explored, and left to the natives. Chief ports: Astrolabe Bay, Friedrich Wilhelm Hafen, and Flinsch Hafen. The seat of gov. was at Rabaul, New Britain (q.v.), and is now at Kokopo. Much of the land is covered with dense forest and its development has but recently begun. Tobacco can be grown, experimental work in the cultivation of cotton and tea has been done, sisal-hemp was exported in

small quantities in Ger. times, and cocoa (since the losses due to the Second World War, the production declined by 80 per cent, only 150 tons per annum being produced against a pre-war potential of 1000 tons, which, however, was never reached), coffee, kapok, and potatoes (at a high-altitude experimental station) are grown. Coco-nut plantations are extensive. Copra is exported in increasing quantities (18,887 tons in 1948, valued at £625,662), and there are excellent timber resources in the forests of the larger is., off N. G. Fishing has been little developed, though pearl-shell is exported. Gold is being produced in varying quantities (the early Spaniards, finding traces of the metal in the is., named it the ls. of Gold), and silver and platinum are mined. Of the total value of products exported in the year ended June 30, 1948, £1,927,075, gold bullion and native gold accounted for £851,000, and other exports were trochus shell £21,000, and cocoa-beans £16,976. Oil has been found, and both the Australian and the Dutch Govts. have granted large concessions to oil interests, Brit., Dutch, Amer., and Australians operating singly or in combination. It is expected that N. G. will prove one of the world's great oil reservoirs, comparable with Borneo. Coal is known to exist, but it is of mixed quality. Osmiridium, copper, iron, and phosphates suitable for manure are found. Revenue (1947-48), £1,699,203; expenditure £1,656,829. There are sev. gov. schools but, except for them, educational work is left to the missions. Health problems are great. There are no reasonably adequate hospital and other facilities for treating serious diseases and injuries, but the Australian authorities estab. the practice of giving native youths a short course of training in the rudiments of medical work. In the Second World War N. G. soon became the prin. theatre of the struggle between the Jap. forces and the allied forces under Gen. MacArthur (q.v.). After bombing Kavieng and Rabaul by long-range aircraft the Jap. invaded N. G. with infantry, artillery, and tanks on Jan. 23, 1942. At one time they were within 30 m. of Port Moresby and were threatening Australia, the N. ramparts of whose defences were then dominated by Jap. bases at Rabaul, Lae, and Salamaua. But by early 1943 Buna, chief enemy base on the N. Papuan coast, had been taken by the Allies, and Jap. warships and transports had suffered two great defeats in Huon Bay and off Kasteng. See further under PACIFIC CAMPAIGNS, OR FAR EASTERN FRONT IN SECOND WORLD WAR; WORLD WAR, SECOND.

See H. Cayley-Webster, *Through New Guinea and other Cannibal Countries*, 1898; C. G. Seligman, *The Melanesians of New Guinea (anthropological)*, 1910; C. G. Rawlings, *The Land of the New Guinea Pygmies*, 1913; F. W. Eggleston (ed.), *The Australian Mandate for New Guinea*, 1928; J. F. Champion, *Across New Guinea*, 1934; C. A. W. Monckton, *New Guinea Recollections*, 1934; J. G. Hides, *Through Wildest Papua*, 1936, and *Papuan Wonder-*

land, 1938; W. C. Groves, *Native Education and Culture Contact in New Guinea*, 1938; N. Goodall (ed.), *The New Guinea News*, 1942; A. Hyma, *The Dutch in the Far East*, 1942; L. P. Mair, *Australia in New Guinea*, 1948; and E. Cheeseman, *Six-legged Snakes in New Guinea*, 1949.

New Guinea, British, see PAPUA.

New Hamburg, vil. of Waterloo co., Ontario, Canada, on R. Nith, 75 m. W.S.W. of Toronto. Pop. 1500.

New Hampshire, one of the New England states (known as the 'Granite State'), and one of the original thirteen states of U.S.A., lying on the Canadian border between Vermont and Maine and N. of Massachusetts, with 18 m. of coast. Land area 9031 sq. m. The surface is largely mountainous, the chief range being the White Mts. in the N. (Mt. Washington 6283 ft., the highest in the N.E. states). There are numerous rvs., the chief being the Merrimac, Connecticut, and Androscoggin, which afford plentiful water-power, and about 600 small lakes. Hay, potatoes, corn, fruit, and vegetables are grown, and forest trees are abundant. The climate is temperate, with long winters. The manufs. are numerous and important, and include boots and shoes, cotton goods, woollens and worsteds, hosiery and leather goods. Minerals are little worked, but there are some good granite quarries. Dartmouth College at Hanover, founded in 1769, is non-sectarian and provides for higher education. The univ. of N. H. at Durham was founded in 1866. The Rom. Catholic Church is the leading one in the state, with 63 per cent of the church membership in 1936. Rom. Catholic schools are maintained in all the cities and some of the large tns. Cap., Concord (27,100). Prin. tns.: Manchester (77,800), Nashua (32,900), Berlin (19,000), Portsmouth (14,800), Keene (13,800), and Dover (14,900). N. H. was settled by Englishmen in 1623, and made part of Massachusetts Bay in 1641, and a royal prov. in 1679. Pop. 491,500. See H. H. Metcalfe, *History of New Hampshire*, 1926; Federal Writer's Project (pub.), *New Hampshire: a Guide to the Granite State*, 1938; and T. Kallijarvi and W. C. Chamberlin, *The Government of New Hampshire*, 1939.

New Harmony, tn. of Posey co., Indiana, U.S.A., on Wabash R. and Illinois Central Railway, 13 m. N. of Vernon, settled by one of the seceding Harmonist colonies of Robert Owen in 1826. There are flour mills and brick works. Pop. 1000. See G. Lockwood, *The New Harmony Communities*, 1907.

Newhaven: 1. Seaport tn. of Sussex, England, on the Eng. Channel at the mouth of the R. Ouse, 6½ m. S.E. of Lewes. It is a bonding port and has regular cross-Channel communication with Dieppe. There is a fort and a coastguard station, and the tn. contains a twelfth-century Norman church. Pop. 8000. 2. Fishing tn. of Midlothian, Scotland, on the firth of Forth, 2½ m. N. of Edinburgh, of which it is a part.

New Haven, co. seat of N. H. co., Connecticut, U.S.A., at the head of N. H.

Bay, 4 m. from Long Is. Sound, with an important foreign and coastwise commerce. It has many handsome buildings, public squares, parks, and gardens. It is the seat of Yale Univ., Hopkins Grammar School, the State Normal Schools, Connecticut College of Pharmacy, and other colleges. It is a commercial distributing centre, and has manufs. of electrical equipment, cutlery, packed meats, rifles, clocks, hardware, and corsets. Fishing and dairy farming are carried on in the dist. Pop. 160,000.

New Hebrides, archipelago of Polynesia in the Pacific Ocean, lying between 13° and 20° S. and 166° and 170° E., and extending over 500 m. The N. H. (the total area of which is about 5100 sq. m.) include the Banks and Torrea groups, the former lying a few miles N. of the main group, and the latter 40 m. N.W. of the Banks Is. The largest is. of the group are Santo (75 m. by 40 m.) and Malekula (nearly as large). Other is. are Efate, Ambrym, Erromanga, Epi, Aoba, Pentecost, and Macovo, and Gaua and Vanua Lava of the Banks group. In addition there are at least sixty small is. and islets. There are four good harbours, Vila and Havannah on Efate, and Ports Sandwich and Stanley on Malekula. The headquarters of the administration are at Vila, which is the chief trade centre. The climate is very enervating but no worse than that of many tropical places. The is. are volcanic and free from coral reefs. The soil is rich and deep, and the surface is densely wooded, and produces breadfruit, sago-palm, bananas, sugar-cane, yam, taro, arrowroot, oranges, pineapples, and coffee, and particularly sandalwood. The chief exports are copra, coffee, cocoa, shell, and sandalwood. The natives are Melanesians and Polynesians. By a convention of Nov. 16, 1887, Britain and France set up a joint naval commission to protect the lives and property of the Brit. and Fr. subjects in the group. By 1902 resident commissioners were appointed by each gov. to deal with judicial cases. Finally, by a new convention of Oct. 20, 1906, Brit.-Fr. condominium gov. was estab. The executive consists of a Brit. and Fr. resident commissioner acting in concert, each assisted by a staff of officers. There is steamboat communication with Australia. The N. H. group was discovered by the Sp. explorer de Quirós (1606), who imagined he had at last found the long-sought S. continent and therefore named it Tierra Australis del Espíritu Santo. He estab. a settlement on a riv. and named it La Nueva Jerusalem and to the port which existed in those days he gave the name Vera Cruz. This is. is to-day known as Santo, but no trace of Vera Cruz can be found. Sailing between the is., known to-day as Santo and Malekula, Bougainville in 1768 thereby disproved de Quirós's claim to the discovery of the S. continent. On this same voyage Bougainville discovered the is. of Pentecost, Aoba, and Macovo, which he named the Cyclades. It remained, however, for Cook to discover and chart the greater part of the group in 1774. He is said to

have spent some fifteen days in the then snug little harbour of Port Resolution, on Tanna Is. Other early visitors were Lapérouse (1788); d'Entrecasteaux, who went in search of Lapérouse (1793); and Bligh who sighted Banks Is. on the occasion of his famous voyage in an open boat to Timor after the mutiny of the *Bounty*. Dumont d'Urville, Belcher, and Murchison are among the early voyagers whose accounts of these is. are of interest. Pop. (natives) 40,000; non-natives 3000. See also ESPIRITU SANTO; MALEKULA. See II. Le Chartier, *La Nouvelle Calédonie et les Nouvelles-Hébrides*, 1885; E. H. Imhaus, *Les Nouvelles-Hébrides*, 1890; Dr. Robert Lamb, *Saints and Savages*, 1908; E. Jaconis, *France and England in the New Hebrides*, 1914; W. H. R. Rivers, *History of Melanesian Society*, 1914; C. B. Humphreys, *The Southern New Hebrides: an Ethnological Record*, 1926; J. R. Baker, *Man and Animals in the New Hebrides*, 1929; T. H. Harrison, *Savage Civilisation*, 1936; and *Captain Cook's Voyages* (Everyman's Library).

Newhills, tn. of W. Aberdeenshire, Scotland, 4½ m. N.W. of Aberdeen. Pop. 6245.

New Holland: 1. Small ferry port on the Lincolnshire shore of the Humber, England. 2. Former name for Australia (q.v.).

New Iberia, cap. of Iberia co., Louisiana, U.S.A., 125 m. N. of New Orleans. It has manufs. of jewellery, paper, lumber, and foundry and machine-shop products. Salt is mined in the dist., and fruits, cereals, and sugar produced. Pop. 8000.

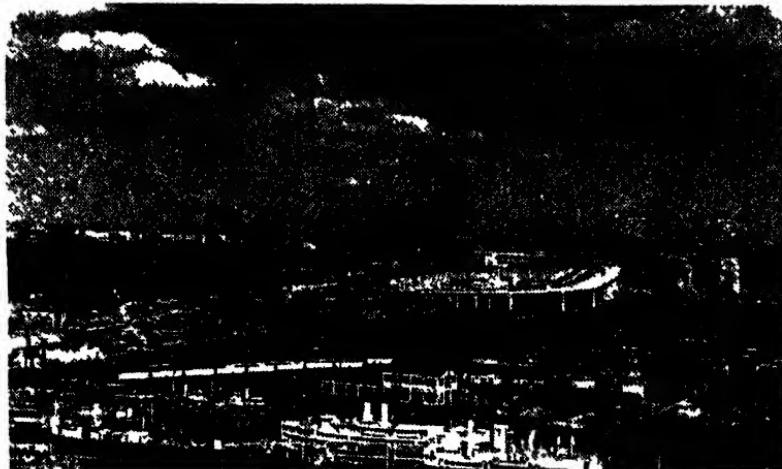
New Ireland, is. of the Bismarck Archipelago (q.v.).

New Jersey, middle Atlantic state of U.S.A., in the N. Atlantic group, bounded on the N. by New York and Pennsylvania, on the E. by the Hudson R. and Atlantic Ocean, on the W. by Pennsylvania and Delaware Bay, and on the S. by the Atlantic and Delaware Bay. It was the third of the original thirteen states which ratified the Federal Constitution. Area 7836 sq. m. (311 sq. m. being inland water). The N. of the state is hilly, being intersected by the Blue Mt. and Highland Range, belonging to the Appalachian system, and sev. other ridges. The state is a gently undulating plain, sloping towards the E. and W. It is watered by the Hudson, Passaic, Hackensack, Raritan, Delaware, etc., rts., and has numerous small lakes. Off the coast is a line of sandbars, enclosing lagoons and marshes. The sea-coast is studded with well-known ocean resorts, the most famous being Atlantic city, Cape May, and Asbury Park. The land is well wooded and fertile. Cereals, especially maize, fruit, and vegetables are largely grown. Market gardening, to supply the needs of New York city, is a large industry. The pasture is good, and there are valuable fisheries. The mineral wealth includes iron, zinc, manganese, talc, soapstone, and graphite. Manufs. are the chief industry, among them being textiles of all kinds, leather, foundry and machine-shop products, petroleum and brewing products, chemicals, and pottery. Higher

education is provided at Princeton Univ founded in 1746, Rutgers College founded in 1766 at New Brunswick, and the Stevens Institute of Technology at Hoboken Cap Trenton (124,700) chief tns Newark (429,800) Jersey city (301,200), Paterson (139,700) Camden (117,500), Elizabeth (110,000) Bayonne (79,200) E Orange (69,000), Atlantic City (64,100). New Jersey was discovered by John Cabot in 1497, it was claimed by the Dutch but passed into Eng hands in 1661 Pop 4,160,000 See E J Fisher, *New Jersey as a Royal Province* 1911 I S Knill (ed.), *New Jersey A History*, 1930, W J Lane, *From Indian Trail to Iron Horse*, 1939 D Kemmerer, *Path to Freedom Struggle for Self Government in Colonial New*

which it forms a suburb, together with Claremont Pop (with Cape) 15,000 2. Vil of Cumberland England, 4 m S W of Keswick in the Newlands valley New London, seaport city of N L co., Connecticut U S A, at mouth of Thames R, 50 m E of New Haven The harbour is one of the deepest on the Atlantic There are manufs of motor cars, silk, woollens, and cotton, as well as shipyards, foundries, and saw mills It is a summer resort and submarine base Seat of Connecticut State College for Women Pop 30,100

Newlyn, port of Cornwall England, 1½ m S W of Penzance, of which it forms a part It has a good harbour and a fishing industry Pop 4000



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NEW JERSEY THE PLAZA

Jersey, 1700-1776, 1910 and C. S. Myers *The Story of New Jersey* (5 vols), 1915 See also the New Jersey Historical Society (pub) *New Jersey Archives*

New Jerusalem Church, see SWEDEN-BORGIANS

New Kensington, tn of Westmoreland co., Pennsylvania U S A on Allegheny R 18 m E of Pittsburgh It has aluminum and tinplate works, glass factories, lead and oil factories, and machine shops There are coal mines in the neighbourhood Pop 17,000

Newlands, John Alexander Reina (1838-1898), Eng chemist After 1865 he practised as an analytical and consulting chemist His name is associated with the conception of the theory of periodicity among the chemical elements—the law of octaves later developed by Mendeleeff and Lothar Meyer His papers on the subject were collected in *The Discovery of the Periodic Law* (1884)

Newlands: 1 Vil of Cape of Good Hope, S Africa, 4 m S E of Cape Town, of

New Lynn, tn on the W boundary of Auckland, New Zealand on an isthmus separating the Waitemata and Manukau harbours It owes its industrial origin to the establishment of tanneries and brickworks in the early days when the district was remote from the city area The spread of pop eventually reached its borders and to day it appears physically as part of the city of Auckland Many new industries were established during the war years, and a pottery company branched out into ceramic manuf in 1942 This branch of its activities has a daily output now of over 20,000 pieces Besides supplying a considerable proportion of the local market, it has developed a substantial export trade in Australia Pop 52,900

Newmains, tn of Lanarkshire, Scotland It is on a coalfield 2 m N E of Wishaw, and has ironworks and steel works, and a far factory for pre cast concrete Pop 60,000

Newman, Ernest (b 1864) Eng music critic, b in Liverpool Originally intended

for the Indian civil service, he took up business owing to ill health. He taught music in the Midland Institute, Birmingham, 1903-5, and was music critic for the *Manchester Guardian*, 1905-1906, the *Birmingham Post*, 1906-19, and the *Observer*, *Sunday Times*, and *Glasgow Herald* at various times. He ed. the monthly *Piano-Player Review*. His following is of the largest, and his intense admiration of the Ger. classical and romantic composers makes him a severe judge of contemporary music schools. His book on Hugo Wolf is one of the best studies of any composer. Other works include *Grieg and the Opera* (1895); *Wagner (The Music of the Masters)* (1904); *Musical Studies* (1905); *Elgar* (1906); *Hugo Wolf* (1907); *Richard Strauss* (1908); *Wagner as Man and Artist* (1914); *A Musical Molley* (1919); *The Piano-Player and its Music* (1920); *A Musical Critic's Holiday* (1925); *The Unconscious Beethoven* (1927); *Fact and Fiction about Wagner* (1931); *The Life of Richard Wagner* (1933-48); *The Man Liszt* (1934); *Opera Nights* (1943); trans. of most of Wagner's opera-texts; of Schubert's *J. S. Bach* (1911); and Weingartner's *On Conducting* (1906), etc.

Newman, Francis William (1805-97), Eng. scholar and man of letters, younger brother of Cardinal N., b. in London. In 1826 he became a fellow of Balliol, but resigned in 1830 through conscientious scruples, and travelled in the E., joining a Baptist mission at Bagdad. He returned to England in 1833, and was classical tutor at Bristol College 1834-40, prof. of classics at Manchester New College 1840-46, and prof. of Lat. at Univ. College, London 1846-63. He then devoted himself entirely to literature. His divergence from the Church of England in the direction of theism and free thought forms a curious contrast to the religious development of his brother. His works include *Catholic Union* (1844); *History of the Hebrew Monarchy* (1847); *The Soul, her Sorrows and Aspirations* (1849); *Phases of Faith, or Passages from the History of my Creed* (1850); *The Odes of Horace translated into Unrhymed English Metres* (1853); *The Iliad*, etc. See M. Arnold *Last Words on Translating Homer*, 1862, and J. G. Stevekling, *Memoir and Letters of Francis W. Newman*, 1909.

Newman, Sir George (1870-1948), public health administrator, educated at Edinburgh Univ. and at King's College, London. At Edinburgh he won the Gunning scholarship in public health and took the diploma of D.P.H. At Cambridge in the same year (1895). He was senior demonstrator of bacteriology and lecturer on infective diseases at King's College, London, 1898-1900. For a short time he was medical officer of health to Finsbury and to Bedfordshire, was chief medical officer of the Board of Education 1907-35, and of the Ministry of Health from 1919 to 1935, in which latter year he retired. One of the chief architects of the modern system of public health administration, in addition to writing numerous official reports he was the author of books on

Bacteriology and the Public Health (1901); *Infant Mortality* (1906); *Bacteriology of Milk* (1908); *Hygiene and Public Health* (1917); *An Outline of the Practice of Preventive Medicine* (1919); and *Recent Advances in Medical Education in England* (1923). Late in his career he turned again to historical studies and wrote *Interpreters of Nature* (1927), a series of biographies of leading figures in medical hist. His Halley-Stewart lectures on 'Health and Social Evolution' were pub. in book form in 1930; *The Rise of Preventive Medicine* appeared in 1932, and *The Building of a Nation's Health* in 1939.

Newman, John Henry (1801-90), Eng. cardinal, was the eldest child of John N., a banker. In 1816 he entered Trinity College, Oxford; two years later he gained a scholarship, and in 1820 he took his B.A.



CARDINAL NEWMAN

degree, having failed to obtain any high academic distinction. In 1822 he was awarded a fellowship at Oriel, the acknowledged centre of Oxford intellectualism, and in the following year the same honour fell to Pusey. In 1826, when N. obtained a tutorship, Richard Froude became fellow. Having assisted Hawkins to the provostship of Oriel, N. was appointed to the vicarage of St. Mary's, Oxford, which Hawkins had just vacated. After resigning their fellowships because Hawkins failed to recognise 'the substantially religious nature' of their office, N. and Froude went abroad to the Mediterranean and to Rome, where they composed many of the short poems afterwards collected in the *Lyra Apostolica* (1834). It was during this tour, whilst he lay becalmed in the straits of Bonifacio, that N. wrote the beautiful hymn, *Lead, Kindly Light*. The Oxford Movement dates from N.'s return home. In July 1833 he resolved with Froude and a few other friends and thinkers to uphold the integrity of the Prayer Book, and to defend the doctrine of apostolic succession. In Sept. of the same year he began his *Tracts for the Times*, and whilst publishing these, he was expounding from the pulpit of St. Mary's the doctrines therein expressed. A chief source, if not the mainspring, of that torrent of religious feeling which passed

forth from Oxford to all parts of the kingdom must be looked for in the intense spiritual conviction, the magnetic and fascinating personality, the eager intellectualism and singular dialectical faculty of N., at that time a leading Tractarian. It was his study of the early fathers, of Athanasius, Origen, and Clement, and of the Monophysite controversy, that first filled his mind with doubts as to the justice of Anglicanism. In 1841 he raised a storm of indignation against himself by his *Tract 90*, in which he argued that the Articles do not disavow Catholicism. He retired to Littlemore near Oxford in 1842, renounced the living of St. Mary's in 1843, and at the same time recanted all his earlier adverse criticism of the Rom. Church. After three years of monastic seclusion at Littlemore he was received into the Rom. Catholic Church in 1845. He was ordained in Rome in 1846 and returned to England as a member of the Congregation of the Oratory (see ORATORY or ST. PHILIP NEVI). He founded the oratories at Birmingham (1847) and London (1850). In 1852 he was fined £100 for libelling an apostate monk, Achilli, notwithstanding his ample demonstration of the truth of his accusations. His splendid and dignified *Apologia pro vita sua* was a reply to the grave and gratuitous slander which Charles Kingsley set down against him in *Macmillan's Magazine* (1864). In it the author traces his mental development with a frankness which must have been repellent to so sensitive a nature, but which must for ever silence any who are inclined to question the transparent purity of his motives or the singleness of his aims. From this 'Apology' it is clear that N. was from the first actuated by his conception of an infallible church, and that a longing to attain, or at least approach to, this ideal alone induced him to transfer his allegiance to the Rom. Church, which seemed the one 'divine kingdom' on this earth. The three years of fasting, prayer, and meditation which he passed in comparative seclusion at Littlemore (1842-45) are a sufficient indication of the grave and earnest spirit in which he took this step. In 1878 he was elected honorary fellow of Trinity and in 1879 he was created cardinal by Leo XIII. One of the great masters of Eng. prose style, his works include *Sermons*, *Lectures*, *Grammar of Assent* (1870). See lives by W. Meynell, 1887; R. H. Hutton, 1891; W. P. Ward (2 vols), 1912; G. G. Atkins, 1931; and H. Tristram, 1948. See also T. Mosley, *Reminiscences* (2 vols), 1882; R. W. Church, *The Oxford Movement*, 1891; Anne Mosley (ed.), *Letters and Correspondence*, 1891; I. Williams, *Autobiography*, ed. Sir G. Prevost, 1892; C. Savoile, *Neumann's Theology*, 1908; W. E. loss, *Twixt the Old and the New: A Study in the Life and Times of Cardinal Newman*, 1916; J. J. Reilly, *Newman as a Man of Letters*, 1925; J. M. Flood, *Cardinal Newman and Oxford*, 1933; F. R. Cronin, *Cardinal Newman, his Theory of Knowledge*, 1935; and R. D. Middleton, *Newman and Bloxham: An Oxford Friendship*, 1947.

Newmarket, mkt. tn. 13 m. N.E. of Cambridge, England, partly in Cambridgeshire and partly in Suffolk. St. Mary's Church, in Suffolk, is not of great interest, while All Saints, in Cambridgeshire, has been rebuilt. The fame of the tn. rests on its races, racecourse, training and racing estabs. The racecourse, adjoining the tn. on the N., is owned partly by the Jockey Club and partly by the duke of Rutland and is said to be the finest in the world. The Jockey Club was founded between 1727 and 1760 when extensive buildings were erected. The horses are trained on the downs where there is a great prehistoric earthwork known as the Devil's Dyke—100 ft. wide and seven miles long. In the tn. is a house reputed to have been occupied by Nell Gwynne. Pop. 10,000. *Newmarket Stakes*, see under HORSE-RACING.



E.N.A.

A COMMUNAL CAVE DWELLING IN THE RIO DE LOS FRÍOLES, NEW MEXICO
DE LOS FRÍOLES

This 'house' contains 200 rooms.

New Mexico, state in the W. of the U.S.A., bounded on the N. by Colorado, on the E. by Texas, on the S. by Texas and Mexico, and on the W. by Arizona, was organised in 1850 and admitted to statehood in 1912. It forms part of a rocky tableland, the Rocky Mts. and the Sierra Madre ranges running through it. In the E. is the Llano Estacado, a barren plain, which is being brought under cultivation by dry-farming and which rises to mt. ranges in the centre of the state, the W. being mainly plateaus. It is watered by the Rio Grande and its affluent the Rio Pecos, and the trib. of the Colorado R. The average height

above sea level in N. M. is 5700 ft., the lowest height being 2876 ft. The climate is dry, the average rainfall being only 12 to 16 in. Much of the land is fertile under irrigation, and agriculture is rapidly becoming the leading industry of the state. The main crops produced by dry-farming are grains, whilst fruit, vegetables, and cotton are grown. Pasture is abundant, particularly on the tablelands where stock-raising and wool-growing are important occupations. Mohair production is a leading industry. There is much good forest land. The mineral wealth includes gold, silver, copper, lead, zinc, coal, granite, limestone, sandstone, marble, and petroleum. The main industries are car construction, lumber, and timber work, flour-milling, butter and cheese making, and the manuf. of evaporated and condensed milk. N. M. is a popular health and tourist resort. A great attraction is Carlsbad caverns, an enormous series of limestone chambers, now a national park. The lowest depth reached is 1350 ft., and the largest room (called the 'King's Palace') is 4000 ft. long with maximum width of 625 ft., and ceiling of over 300 ft. Below this room are three vast chambers known as the 'Palace of Pluto,' discovered at the 900 ft. level (150 ft. below the 'King's Palace') in 1939. Many of the white people of N. M. are of Sp. or Mexican descent, and Sp. is still spoken. N. M. has over 4,600,000 ac. of Indian reservations, with over 28,000 Indians on them. There are eighteen Indian pueblos or vil., with 11,000 people. Cap., Santa Fe (20,300), which contains the State Univ. Chief tns.: Albuquerque (35,400) and Roswell (13,400). Area 121,511 sq. m. Pop. 531,800. See E. A. Powell, *The End of the Trail: the Far West from New Mexico to British Columbia*, 1915; G. P. de Villagrà, *History of New Mexico* (trans. by Espinosa), 1933; and L. Bloom and T. Donnelly, *New Mexico: History and Circles*, 1933.

New Milford, tn. and the co. seat of Litchfield co., Connecticut, U.S.A., 30 m. N.W. of New Haven. Pop. 5000.

New Mills, tn. of Derbyshire, England, on Rts. Goyt and Sett, 15 m. E. of Manchester; prin. industries are textile printing, bleaching, and dyeing. Pop. 8400.

Newmilns, burgh of Ayrshire, Scotland, on the Irvine, 7 m. E. of Kilmarnock. The burgh includes Greenholm on the other side of the riv. There are lace and Madras manufs. Pop. 4000.

New Model, name given to the army organised by Parliament on Feb. 15, 1645. It was formed on the plan of Cromwell's Ironsides, and was under the command of Sir Thomas Fairfax, Cromwell holding the position of lieutenant-general. Its first success was the battle of Naschy, and it was the chief military instrument of the parl. victory in the Civil war.

New Monkland, see MONKLAND.

Newnes, Sir George (1857-1910), Eng. magazine and newspaper publisher, b. at Matlock, Derbyshire. He ensured his first success in the publishing world by his

production of *Tit-Bits* in 1881, which eventually led to his opening the present offices in Burleigh Street and Southampton Street, Strand. In 1885 he became a member of Parliament, sitting for Newmarket on the Liberal benches until 1895. In the latter year he was made a baronet, and five years later he became M.P. for Swansea. Among other magazines and papers which he founded or ed. are the *Strand Magazine*, the *Ladies' Field*, the *Wide World Magazine*, *Country Life*, and *C. I. Fry's Magazine*.

Newnham College, for the higher education of women, at Cambridge, was organised in 1873 and opened in 1875. Five women students came to study at Cambridge in 1871, twenty-five in 1874, 220 in 1912, and at the present time so many women seek admission that even those who have passed the college entrance examination are still dependent on the number of vacancies available in that year. The college was incorporated in 1880, and for thirty years the students enjoyed most of the scholastic privileges offered by the univ.; their names appeared in the tripos or honours lists, but they were not allowed to hold degrees. In 1917 a royal charter was obtained, and in 1923 women were admitted to degrees. In Dec. 1947 full membership of the body academic was granted. The buildings include North Hall (1880), Clough Hall (1888), Pelester Building (1893), Pele Hall (1920), Kennedy Buildings (1906), Old Hall, Sidgwick Hall, and the Library. There are about a dozen scholarships and exhibitions, all tenable for three years, available to new students when vacant, and about the same number to fourth-year students or to women who have especially distinguished themselves in some particular study. See Mary A. Hamilton, *Newnham*, 1936.

New Norfolk, tn. of Buckingham co., Tasmania, 21 m. N.W. of Hobart, on the R. Derwent. Pop. 2000.

New Order (or Hitler's New European Order), introduced by the National Socialist Gov. in the countries overrun by the Nazi armies (1939-41). The N. O. was defined by Dr. Funk, Ger. minister of economics, on July 25, 1941, as meaning that 'the peace-time economy must guarantee to the Greater Ger. Reich a maximum of security and to the Ger. people a maximum consumption of goods, in order to increase their welfare. European economics must be directed towards this end.' The ultimate objective of the N. O. was to turn Europe into a single economic unit, self-supporting in essentials, while trade with the outside world would be conducted by a single authority dealing directly with individual states; for the N. O. did not recognise the right of other continents to the benefits of cohesion which it claimed for itself. In brief, the N. O. involved a ruthless readjustment of European economy to suit Ger. ends and a monopoly of industrial production in Europe for the 'master people' (*Herrnnvolk*). The frontiers of the Reich were so drawn as to take in the main industrial areas of Europe:

Luxembourg, Alsace-Lorraine, the Czech protectorate, Silesia, and W. Poland, including the large textile industrial area of Lodz. The Reich bought up control of industries outside this central block, e.g. in Hungary, Rumania, and Yugoslavia, and probably control was estab. in some form over the industries of N. Italy. Otherwise industrial development outside the Reich was to be suppressed, for the N. O. envisaged an agric. Europe feeding an industrial Germany. The contemplated new Greater Germany contained approximately 43 per cent of the industrial pop. of Europe (excluding Russia) against 19 per cent of its agric. pop., and provided 75 per cent of its total steel output or would do so when fully operative (these figures, however, omit Belgium and N. France, countries which Germany did not in 1941 apparently include within the area of Greater Germany). The N. O. offered certain evident attractions to the agric. or peasant states, since they would be certain of a market for their export surpluses of food and raw materials, without having to face the competition of the new world; but in fact, as Germany had manipulated the mark exchange since 1936, these satellite states would sell their exports cheaply and receive in return dear and inferior manufactured goods or nothing. Under the N. O. Britain was to be barred from European and African markets. Raw materials, but nothing else, would be accepted from Russia. The Lat.-Amer. states would lose the bulk of that 23 per cent of their exports which normally went to the conquered European countries. The spectacle of a future Germany exercising world hegemony through economic control was reflected in her dealings with occupied countries during the war. The N. O. in action was in fact one long record of systematic terrorism (*see under* the historical sections of the various European countries concerned). It should be noted that the N. O. was originally a Jap. phrase, adapted to Jap. ambitions in the Far E., and that it was only after the phrase had been appropriated by Hitler and had fallen into disrepute in Europe that it was transmuted into 'Co-Prosperity.' But whether it be called the N. O. or Co-Prosperity, the substance was the same. It involved the conquest of all Asia, and economically it meant the subjugation to Japan of all the other members supposed to be enjoying Co-Prosperity, the weak points in which sphere were Japan's inadequacy of shipping facilities, and lack of steel, cotton, and wool.

New Orleans, chief city and seaport of Louisiana, U.S.A., cap. of Orleans par. on the Mississippi R., chiefly on the l. b. The largest municipal limits are co-extensive with those of the par. of Orleans, and among the suburbs are Westwego, Gretna, McDonoghville, and Algiers, its W. dist., with a riv. frontage of 3 m. The site on which the city is built is almost perfectly level and lies so low that the difficulties of drainage are great. N. O.

lies below the levee of the riv. at high tide and is therefore protected by an extensive series of embankments called levees. The cemeteries are a peculiar feature of N. O.; owing to the water-saturated nature of the soil, bodies are buried in vaults often 12 ft. above the ground level, the coffins being ranged in tiers. In the past it has been regarded as an unhealthy city, but modern scientific methods have changed this reputation. The climate is not marked by extremes of either heat or cold. The Fr. or Lat. quarter of N. O. is separated from the Amer. quarter, or New City, by Canal Street, the centre of the retail trade, and just below this street are many of the most important buildings of the city. The Custom House, built of granite, is one of the largest and most important edifices in the U.S.A. There are also the cotton exchange, city hall, criminal courts, Howard Memorial Library, the post office, sev. handsome churches, and other buildings. Tulane Univ., founded in 1834, has state support in the shape of remission of certain taxes. It has over 400 profs. and over 4000 students. The N. O. Univ., founded in 1874, is for coloured students. The Fr. quarter of N. O. is that part closely connected with the hist., poetry, and romance of the city, and the influence of the Fr. and Sp. regimes still survives in the mode of life, customs, holidays, and social observances. A notable feature each year is the celebration of *mardi gras* with elaborate night pageants, balls, etc. It has one of the most dramatic histories of any U.S. city, being one of the settlements of Bienville in 1718 and was made cap. of the vast region known as Louisiana. It was ceded with Louisiana to Spain in 1763. In 1800 it fell to France, from whom it was purchased by the U.S.A. in 1803 as part of the great Louisiana purchase. In the eighteenth century N. O. rapidly grew as the outlet for riv.-borne cargoes down the Ohio and Mississippi, ever-increasing numbers of rafts and flatboats floating downward with grain, salt meat, and potash to what then was Fr.-owned port. It was at N. O. in the war of 1812 that the Amer. defeated Pakenham's veterans, one of their few successes in that war. Sugar-growing in N. O. was introduced in 1794-95 by an enterprising creole, Etienne Boré, who set up machinery and vats and inaugurated a boom. The first steamboat to run from Pittsburgh through N. O. and back was built in 1811 by Nicholas Roosevelt of a family which was later to become famous. In the civil war David Farragut, with a fleet of wooden sloops, forced the surrender of N. O., the Confederacy's largest and wealthiest city. The most important industries, apart from sugar-refining, are fire-cleaning and the manuf. of cotton-seed oil, iron ware, soap, cotton goods, cigars, clothing, etc. Tonnage of vessels entered and cleared in foreign trade is about 3,500,000 and 4,800,000 respectively. There is a navy yard and construction and repairing estab. Pop. 494,537 (including about 100,000 Negroes).

New Philadelphia

660

News Agencies

New Philadelphia, city and co. seat of Tuscarawas co., Ohio, U.S.A. Manufs. include iron, especially agric. implements, electric and vacuum cleaners, and sheet iron. Pop. 12,300.

New Pitsligo, tn. of Aberdeenshire, Scotland, 11 m. S.W. of Fraserburgh. In the vicinity are large granite quarries. Pop. 2000.

New Plymouth, cap. and a port of the dist. of Taranaki, North Is., New Zealand, 160 m. S.W. of Auckland. It has an extensive harbour, and is a holiday resort. There is an airport. Pop. 20,300.

New Pomerania, see NEU-POMMERN.

Newport: 1. Parl. and municipal bor., mkrkt. tn., and riv.-port of England, chief tn. of the Isle of Wight, and situated near the centre of that is., on the Medina, which is navigable up to this point. St. Thomas' Church, founded in 1854, on the site of an ancet. structure built in the reign of Henry III., is a handsome edifice, and contains a monument erected by Queen Victoria in memory of the Princess Elizabeth, daughter of Charles I., who d. at Carisbrooke Castle, Sept. 8, 1650. The castle is about a mile N. of Newport and is where the king was confined under the guardianship of Col. Hammond for twelve months (1647-48). In the vicinity are the Albany barracks and Parkhurst prison. Lace manuf. and brewing are carried on to some extent. Vessels of considerable tonnage can ascend to the quay at high tides. Pop. 11,300. 2. Municipal and co. bor. in Monmouthshire, England, situated at the mouth of the Usk, a parl. constituency and a market and assize tn. The inhab. are engaged in shipbreaking and repairing, iron, steel, and aluminium undertakings, the manuf. of chemicals, clothing, confectionery, rubber goods and electrical equipment, and the shipping of coal and general merchandise. The dockage and wharfage are extensive. It was formerly a walled tn. defended by a castle, the ruins of which still stand. St. Woolos Church, the cathedral of the diocese of Monmouth, dates from Saxon times. One of the few transporter bridges in the world spans the Usk. Pop. 105,000. 3. Seaport of Fifehire, Scotland, on the firth of Tay, opposite Dundee. Pop. 3400. 4. City and co. seat of Newport co., Rhode Is., U.S.A. It is a very fashionable summer resort, and has a good harbour and a naval training station. Close by is situated the U.S. torpedo station. It has a fishery and manufs. of cigars, furniture, brass, and copper. Pop. 30,500. 5. City and co. seat of Campbell co., Kentucky, U.S.A., on the Ohio R., opposite Cincinnati. There are flour mills and iron foundries, and manufs. of machinery. Pop. 30,600.

Newport News, city and port of Warwick co., Virginia, U.S.A., on the James R. It has an excellent harbour, one of the world's largest shipbuilding yards, iron works, coal wharves, lumber mills, and dry docks. Pop. 37,000.

Newport Pagnell, mkrkt. tn. of Buckinghamshire, England, on the Great Ouse where it is joined by the Ouse. It is

14 m. from Buckingham and 50 m. from London on the Midland Region railway, and the Grand Union Canal passes 2 m. from the tn. It is in an agric. dist. and also has motor-car body works. Pop. 5000. **New Providence**, see BAHAMAS and NASSAU.

Newquay, holiday resort on the N. coast of Cornwall, England, about 11 m. N. of Truro. Pop. 9600.

New Red Sandstone, see TRIASSIC SYSTEM.

New Richmond, port of Bonaventure co., Quebec, Canada, on the bay of Chaleur, 60 m. E. of Quebec. Pop. 2000.

New River, Eng. artificial cut or channel, now about 27 m. long, stretching S. from Chadwell and Amwell Springs, Hertfordshire, just S.W. of Ware, augmented from the Lee (Lea) at Broxbourne, and conveying these waters into reservoirs at Hornsey and Stoke Newington (N. London), the latter having a capacity for holding 92,000,000 gallons. It affords a great part of the London water supply. Begun in 1609 by Sir H. Myddleton, it was completed by a corporation in Hertfordshire and Middlesex (1620). The N. R. Head reservoir at Clerkennell was opened in 1613. The property was originally divided into about seventy-two shares (of £100 each), thirty-six being 'adventurers' shares, held by Myddleton and twenty-eight others, and the remainder granted to the king. Charles I. exchanged them (1631) for an annuity of £500. The adventurers' shares have in later years been valued at over £100,000 each (one sold for £125,500 in 1897). The Metropolitan Water Board took over this company and seven other London water companies in 1904, at a valuation of over £6,500,000. The N. R. area of service was extended to Chingford by the making of a new reservoir in 1913.

New River (U.S.A.), see GT. KANAWHA.

New Rochelle, tn. of Westchester co., New York, U.S.A., on Long Is. Sound, 18 m. N.N.E. of New York. The Knickerbocker Press is estab. there; druggists' scales and balances and speedometers are manufactured. Pop. 58,400.

New Romney, see ROMNEY, NEW.

New Ross: 1. Tn. of Wexford and Kilkenny cos., Eire, on the Barrow, 2 m. below the confluence of the Nore, 13 m. from Waterford. The Irish insurgents were defeated here by the Loyallists under Johnston and Mountjoy (1798). Pop. 4900? 2. Post vil., Lunenburg co., Nova Scotia, 45 m. W. of Halifax. Pop. 1300.

Newry, seaport of Down and Armagh cos., N. Ireland, one of the chief ports of Ulster, on Newry Water, near Carlingford Lough, 33 m. S.S.W. of Belfast. There are corn, flour, and spinning mills, and potato processing, textile, wheelbarrow, clothing, knitting, and tobacco factories; also breweries, with granite quarries near by. Pop. 14,000.

News Agencies. Agencies for gathering news and supplying it to newspapers and for broadcasting, and also to private subscribers, though in the latter case not for press pub. To a certain extent the news agency reporter has supplanted the

newspaper reporter, the latter being now more often employed in 'descriptive' reports or on 'stories' which are of special interest to his particular newspaper. In practice the great London newspapers use foreign cables of the N. A. merely to supplement their own services, the news agency service (apart from Reuter's agency) being useful mainly for home news. In England the most important news agency is the Press Association, which was formed in 1868 when Parliament passed an Act empowering the state to take over the telegraphs. Its members are the prin. proprietors of the prov. newspapers (see PRESS ASSOCIATION). Another leading Brit. news agency is the Exchange Telegraph Company, notable for its 'tape' service. Reuter is the chief agency in Britain for foreign views, and has correspondents in all parts of the world. The Press Association has the sole right of circulating Reuter telegrams in the provs. Besides general news the N. A. also cover parl. reports, market news, and sport. The chief N. A. of the U.S.A. are the Associated Press of America and the United Press Association of America, both with London branches.

New Sarum, see SALISBURY.

'News Chronicle, The', founded as the *Daily News* in 1846, under the editorship of Charles Dickens. From 1869 it was the recognised organ of the Liberal party in England. The *Daily News* was among the earliest papers to publish foreign telegrams. For a time it appears to have been the only 'daily' to admit engraved blocks or displayed advertisements. For years its only serious London rival in Liberal journalism was the *Morning Star*, which it bought up in 1870. Later it became identified with Liberal imperialism; but after it was taken over by George Cadbury it became more 'progressive,' and even struck a semi-Socialist note. In 1928 the *Daily News* absorbed the *Westminster Gazette* (q.v.)—which had changed from an evening to a morning paper some years previously—and in 1930 the *Daily Chronicle* was also amalgamated with the *Daily News* under the present title *News Chronicle*, which paper has thus remained the sole Liberal daily paper in London, long tenacious of Free Trade principles and other cardinal features of twentieth-century Liberalism (q.v.). The *N. C.*, which devotes more space and consideration to political matters and foreign affairs than do most popular papers, includes among its readers a fairly large proportion who buy it on account of its political articles. Like other popular Brit. newspapers, the *N. C.* gives more space to its Amer. correspondents than before the Second World War, but even before the war the *N. C.* was consistently well served by able Washington correspondents. To-day, in conjunction with members of the Cadbury family, Lord Layton, while not actually editor of either the *N. C.* or the *Star* (the evening paper owned by the *News Chronicle Ltd.*), is the editorial and business chief.

New Shoreham, see SHOREHAM, NEW.
New Siberia Islands, Novaya Sibir, or

Liaikov Islands, group of Russian is. in the Arctic Ocean, N.E. of the Lena Delta. Area 9650 sq. m. They include Kotelnoi, Fadievska, New Siberia, Liaikov (Lyakhov), Thaddeus, and smaller is. They are mostly uninhabited, except temporarily by hunters. Fur-bearing animals abound. Bones of the mammoth and other extinct animals have been found. Liaikov discovered the is. in 1770.

'News of the World', Eng. Sunday newspaper, founded in 1843, the fourth oldest of Eng. Sunday newspapers. It was acquired in 1891 by the syndicate which still controls it, and is the only Eng. newspaper to be independently owned. The editor from 1891 to 1941 was Sir Emsley Carr. The policy of the paper was admittedly sensational, giving more space than did any other to police court and divorce proceedings, and this has been maintained except for the restrictions in the latter subject enforced by the Judicial Proceedings (Regulation of Reports) Act of 1906. In addition a most comprehensive sports review is provided. Before the First World War Sunday newspapers met with much disfavour, but even in 1906 the sales of the *News of the World* exceeded 1,000,000; the average for July-Dec. 1947 showed a circulation of 7,891,275, the largest for any newspaper in the world. The company has a strong financial position, its liquid resources exceeding £2,500,000.

New South Shetlands, group of is. in the Antarctic Ocean, see SOUTH SHETLANDS.

New South Wales, oldest state of the commonwealth of Australia, in the S.E. portion of the is. continent, extending between lat. $28^{\circ} 10'$ and $37^{\circ} 28'$ S., and 141° and 154° E., with an area of 309,433 sq. m. and a coastline of over 700 m. There are 146 municipalities and 134 shires. Within the state of N. S. W. the mt. range which girdles nearly the whole is. is most continuous and elevated, and is known as the Dividing Range. The section of this mt. system on the S. boundary called the Australian Alps, rises in Mt. Kosciusko to 6500 ft. From this the range extends northward, the watershed being from 50 to 150 m. distant from the E. coast, and thus divides the state into two slopes, with two distinct water-systems. The rvs. on the E. side descend with great rapidity, and in oblique tortuous courses, their channels often forming deep ravines. Many of them are navigable in their lower course for sea-going steamers. The prin. are the Richmond, Clarence, McLeay, Manning, Hunter, Hawkesbury, and Shoalhaven. The Hunter R., about 60 m. north of Sydney, opens up one of the most fertile and delightful dists. in the country. The Dividing Range, which, opposite to Sydney, is called the Blue Mts., being singularly abrupt and rugged, and full of awe-inspiring chasms, long presented an impenetrable barrier to the W. and kept the colonists shut in between it and the sea, and utterly ignorant of what lay beyond. At last, in 1813, when the cattle were likely to perish in one of those long droughts that appear to visit this country

at intervals of a dozen years, some adventurous individuals scaled the formidable barrier; and discovered those downs on the W. slope which now form the great sheep-ranges of Australia. A practicable line of road was immediately constructed by convict labour, and the tide of occupation entered on the new and limitless expanse. The numerous streams that rise on the W. side of the watershed within the state all converge and empty their waters into the sea through one channel

severe frost are sometimes experienced. At Sydney the mean temp. of the year is about 65°. The mean heat of summer, which lasts here from the beginning of Dec. to the 1st of Feb., is about 80°, but is much modified on the coast by the refreshing sea breeze. The ann. fall of rain is about 50 in. Rain sometimes descends in continuous torrents, and causes the rivs. to rise to an extraordinary height. N. S. W. is in the main an agric. country, and much attention is devoted



Australian News and Information Bureau

NEW SOUTH WALES

BROKEN HILL, THE RICHEST SILVER, LEAD, AND ZINC MINE IN THE WORLD

Looking north along the line of lode, the Broken Hill South Ltd. mine is seen in the foreground; behind it is the mile-long vast Open Cut, now worked out. To the right is the central power station which supplies all the mines with electricity.

within the state of S. Australia. The S. and main branch of this great riv. system is the Murray. The other great trunks of the system are the Murrumbidgee, which is navigable; the Lachlan, at times reduced to a string of ponds, and the Darling. The Macquarie, passing through the rich dist. of Bathurst (q.v.), is a large trib. of the Darling, but it reaches it only in the rainy seasons. Numerous good harbours formed by the estuaries of the rivs.

Owing to the great extent of the state, stretching as it does over eleven degrees of lat., the climate is very various. In the northern dists., which are the warmest, the climate is tropical, the summer heat occasionally rising in inland dists. to 120°, while on the high tablelands weeks of

to stockraising. The prin. crops are wheat, maize, barley, oats, potatoes, lucerne, and tobacco, and fruit culture has greatly developed in recent years—oranges, lemons, and mandarins predominating. In 1946-47 there were 6,511,493 ac. under crops. The area under wheat was 4,474,891 ac. (15,000,000 bushels); oats, 557,987 ac. (2,000,000 bushels); maize, 110,038 ac. (2,500,000 bushels); lucerne (hay), 79,686 ac.; rice, 31,995 ac. (2,978,000 bushels); barley, 26,398 ac.; potatoes, 21,309 ac.; and tobacco, 402 ac. The area under grapes was 16,338 ac.; citrus fruit (principally oranges), 29,917 ac. (33,000,000 bushels); other orchards 38,319 ac. Sugar-cane produced over 309,605 tons of sugar.

Bananas, pineapples, and passion fruit are also grown. The recognition of the fact that the cultivable area might be greatly extended by a system of water conservation and irrigation has induced the gov. to undertake various detached works and schemes, which are designed to constitute a portion of the system necessary to serve the whole state. The most striking of these is the Murrumbidgee scheme, with a storage dam across the Murrumbidgee at Burinjuck. Enormous areas are utilised for grazing purposes, and the state is rich in mineral deposits. Silver, lead, and zinc are mined at Broken Hill (q.v.). Large iron and steel works, with subsidiary factories, are in operation near the coalfields at Newcastle and Port Kembla. The products include iron and steel of various grades, boilers, pipes, wire, brass cables, etc.

The staple exports are wool and wheat. The other prin. exports are butter, lead, coal, coke, skins and hides, tallow, frozen and preserved meat, sausage casings, biscuits, confectionery, fruit (fresh and preserved), wines, tobacco, pearl shell, leather, timber, copper ingots, tin, zinc, gold specie, and gold bars. The total value of the production of the primary industries in 1948-49 was £136,190,000. The value of exports overseas in Australian currency in the year ended June 30, 1947, was £116,579,872, and of imports from overseas £94,268,506. The manufs. of the state are varied and numerous. The chief industrial products are industrial metals, machines, etc.; clothing, food and drink, and tobacco; chemicals, paint, oil; wood-working, paper, printing, textiles and textile goods (not dress), skins, and leather (not footwear). The total value of manufactured products (1946-47) was £115,947,000; dairying and farmyard production, £22,048,000; mining, including the output of quarries, £20,808,754. Coal to the value of £9,582,485 was produced in 1946. Sydney (pop. 1,484,000) is the cap. Other important tns. are Greater Newcastle, 127,000; Greater Wollongong, 63,000; Broken Hill, 27,000; Blue Mts., 21,300; Maitland, 19,000; Goulburn, 16,000; Wagga-Wagga, 15,300; Lismore, 15,000; Lithgow, 14,500; Albury, 14,400; Orange, 14,000; Cessnock, 13,000; Liverpool, 12,800; Tamworth, 12,000; Grafton and S. Grafton, 12,000; Bathurst, 12,000; Dubbo, 9500; Armidale, 8000; Parkes, 7000; Casino, 6700; Inverell, 6500; Kempsey, 6300; Forbes, 6000. Sydney is the headquarters of the squadron in Australian waters, and is the seat of a univ. A bridge across Sydney harbour, the largest arch bridge in the world, was opened in March 1932. Education is compulsory between the ages of six and fifteen years. The railways and tramways are mostly state-owned. On June 30, 1947, 6128 m. of gov. railway were open. N. S. W. took its origin in a penal estab. formed by the Brit. Gov. in 1788 at Port Jackson, near Botany Bay (lat. 34°). The prisoners, after their period of servitude, or on being pardoned, became settlers, and obtained grants of land. Transportation to N. S. W. ceased

in 1840, and up to that date the total number of convicts sent thither amounted to 80,700, of whom only 8700 were women. They were assigned as bondservants to the free settlers, who were obliged to furnish them with a fixed allowance of clothing and food. In 1843 a practically elective legislative council was estab., and twelve years later responsible gov. was granted. The constitution is based on the Consolidating Act of 1902. Parliament consists of two Houses, the legislative council and the legislative assembly. The council, once a nominated body, was reconstituted after the referendum of May 1933, and now consists of 60 members, elected jointly by both Houses. Membership is for twelve years, fifteen members retiring in rotation triennially. Members are not entitled to remuneration. The assembly consists of 90 members and are paid a salary of £275 a year. The duration of a Parliament is limited to three years. The Women's Legal Status Act, 1918, gives women the same political rights as men. The executive is in the hands of a governor, appointed by the Imperial Gov., and an executive council consisting of members of the Cabinet. The pop. in 1947 was 2,885,464 (exclusive of full-blood aborigines). See *Official Year Book of New South Wales* (ann.); *New South Wales Statesman's Year Book* (800 statisticians); also A. G. Foster, *Early Sydney*, 1920, and E. Mitchell, *Australia's Alps* (Sydney), 1942.

New South Wales Government Railway. Under this title in 1855 the gov. of N. S. W., Australia, took over the Sydney Tramway and Railway (1851, the first railway of the state) and the Hunter R. Railway (running from Newcastle to Maitland). A line was opened (1856) from Sydney to Parramatta. The present system includes the S. line and branches (from Sydney to Albury); the N. line and branches (from Sydney to Jennings); and the W. line and branches. The gauge is 4 ft. 8½ in. The Federal Cap. Ter. Railway (Queanbeyan-Canberra), after completion, was taken over by the chief commissioner of railways for N. S. W., who worked the line on behalf of the Commonwealth Gov. until 1928, when the management was taken over by the commonwealth railways commissioner. It connects with the N. S. W. railway system at Queanbeyan and is about 5 m. in length.

Newspapers. It is not easy to trace the origin of the newspaper press, but at least it is clear that analogies in the Rom. *Acta Diurna* or the Venetian *Gazzetta*s are very remote, and hardly less so than the old Eng. news-letters of the sixteenth century. It was, however, essentially the invention of printing and the more or less accidental removal of restrictions on the liberty of the press that favoured the growth of modern N. According to Cleero, Petronius, and other writers, the *Acta Diurna* (called also *Acta Urbana* or *Publica*) pub. an account of anything worthy of note. But they are rather to be regarded as the official notification or registration of important public events than the voluntary presentation of news

as a commercial speculation. It is recorded that the republic of St. Mark had its N., and it is very probable that we borrowed, if not the idea of a newspaper, many of the terms in familiar use to-day in connection with N. from the Venetians, *v.g.* the word 'gazette,' which word is apparently derived from the name of the coin charged for reading them. Like the *Acta Diurna* the Venetian gazettes were hung up in public places. The first man to print all the news of the day upon a single sheet, in a regular weekly pub., with a distinctive title, was Nathaniel Butter, who brought out the *Weekly News* in 1622. Up to that time the only means of circulating news was the news-letters, which were the MS. productions of professional London newswriters who collected the gossip and rumour of the city (*see also JOURNALISM*). There were, however, during the Civil war and the Commonwealth a great number of N., but their pub. was only by leave of the Star Chamber. The press became temporarily free on the abolition of the Star Chamber, but the Long Parliament, becoming frightened by the mass of pamphlets which were soon broadcast over the country, again subjected books and other reading matter to licensing regulations. At the Restoration a most retrogressive step was taken in the passing of the Licensing Act, which vested in the gov. the entire control of printing. It was the non-renewal of this Act in 1695 on its automatic expiration that paved the way for the freedom of the press.

Among the earliest of Eng. N. after the Restoration were the *Protestant Intelligence*, the *Current Intelligence*, the *Domestic Intelligence*, the *True News*, and the *London Mercury*. But none of them printed debates in Parliament, and none exceeded in size a single small leaf, or was pub. oftener than twice a week. The first daily newspaper, the *Daily Courant*, was not pub. till the accession of Queen Anne in 1702. Even after the abolition of the licencer of books (including N.), there was another obstacle to the free pub. of N. in the shape of the N. tax, the Bill for which was passed as the Stamp Act in 1712. It was the old bugbear of sedition which prompted this device for killing the N., a device which was eminently successful, for not one penny paper survived, and even Addison's *Spectator* collapsed, while Steele incurred the wrath of the attorney-general for articles in the *Englishman* and the *Crisis*, which were held to be 'aspersions upon the character of Queen Anne, and assaults upon the conduct of the administration.' But the printers soon evolved means of evading the Stamp Act; and in this they were aided and abetted by the leaders of the opposition, to whose often scurrilous and venomous attacks on their political rivals we owe the beginning of the pub. of proceedings in Parliament. In 1738 Parliament seems to have taken steps to stop the practice of reporting, for the debates were thereafter pub. as if they had taken place in a fictitious assembly. But at the end of the eighteenth century

public sympathy for reporting became too strong for parl. privilege, with the result that reporting gradually became recognised as lawful. Parl. reporting laid the seeds of the future prosperity of the *Morning Chronicle*. Thereafter N. quickly developed into a form more or less similar to that of to-day.

A modern newspaper derives its news from two main sources: its own staff of reporters and correspondents and the news agencies (*q.v.*). Inasmuch as the material sent out by the news agencies is common to all their newspaper subscribers, N. would differ little from each other if they did not import individuality and colour through their own staffs. The staff of a newspaper consists of a body of full-time reporters at the head office, who receive their daily assignments from the news editor, and the political, diplomatic, dramatic, and other correspondents, who are really reporters in a special sphere and often enjoy the confidence of influential persons. *The Times* is to-day the only newspaper to maintain its own press gallery staff in the House of Commons; other N. depend on agency reports and sketch writers, while lobby correspondents keep close contact with ministers and other Members of Parliament and write on expected political and administrative developments. A staff of reporters is also kept at the law courts. The law reporters of *The Times* are required to be barristers and the pub. vols. of *The Times Law Reports* are accepted as authentic records of judgments. Under the news editor there are also correspondents in prov. tns. who send in their copy by telegraph or telephone. The foreign news editor deals with the messages sent by the newspaper's correspondents abroad; distant messages are sent in by cable- or radio-gram, but those from European caps. are normally sent over the telephone and taken down by dictaphone or in shorthand. A newspaper's correspondents, whether home or overseas, may be full-time staff men and required to work exclusively for the newspaper; others, in less important centres, may do other work and are paid a retaining fee and space rated. Distinctions such as 'our special correspondent,' 'a correspondent,' 'a special correspondent,' 'our correspondent,' 'our own correspondent' are all well understood in Fleet Street; the first and last of these only are staff men as opposed to outside contributors and mostly their remuneration is much higher. The miscellaneous mass of news from whatever source received is prepared for the press by sub-editors, whose function is to select, compress, and correct and also to indicate the type and appropriate headings and sub-headings. The selection among the copy is done by a copy-taster, who 'spikes' (*i.e.* defers indefinitely) some and passes the remainder to his colleagues with a symbol indicative of its importance; the selection within the copy itself is done by the sub-editors, while the chief sub-editor approves and revises the sub-ed. copy.

A modern newspaper is not, however,

made up exclusively of news, and a large though very varying place is taken by 'features.' Thus the correspondence columns and the 'turnover' article are features of *The Times*, while birth, marriage, and obituary notices are a feature of both *The Times* and the *Manchester Guardian*. These are admitted in proof of pedigree at the College of Heralds. Social and political gossip is also a feature; others are political cartoons, and 'strip' cartoons and cross-word puzzles. Apart from news and features, a newspaper should have leading articles or editorials. These may be important and influential, such as those in *The Times*, *Manchester Guardian*, *Daily Telegraph*, and *Yorkshire Post*, which are always closely studied by the politicians, and in the Brit. press 'leaders' are unsigned because they are the views or policy of the paper and not of an individual.

It is often said that advertisers exert an undue influence over editorial matter; but although a great part of the revenue of a newspaper comes from advertising, most Brit. N. now carry news on the front page, though *The Times* and the *Manchester Guardian* are among the great national papers which still devote the whole front page to advertisements. Illustrations may be given to show that direct or indirect control by advertisers might tend to become dangerous, but the danger may, on the whole, be said to be hypothetical. Again, though a high circulation enables advertising rates to be increased, nothing so damages the tone of a newspaper as competition for big circulation, and, generally speaking, the N. which have the greatest influence on public opinion have comparatively low but steady circulations among sections of the public whose support is politically valuable. It has been well said that in Britain the power of the N. to influence opinion and policy is, in fact, almost in inverse proportion to circulation, though the rule is, of course, not mathematically exact (cf. Ivor Thomas, *The Newspaper*, Oxford Univ. Press pamphlets on Home Affairs, No. H.2., 1943). For the outstanding features of novelty in modern journalism, and some remarks on Fr. and Amer. N., see JOURNALISM; for the lists of individual N. see under the name of the newspaper, and for the hist. and bearing of advertisements on N. see ADVERTISEMENTS.

The outstanding feature of newspaper finance in more recent years has been the growth of combines controlling chains of N. One of the prin. groups is Associated N. Ltd., which owns the *Daily Mail*, *Sunday Dispatch*, *Evening News*, and a chain of prov. N. This company has a large holding in Anglo-Newfoundland Development Company Ltd. (see under NEWFOUNDLAND). Another large group was the Berry group, but the brothers Wm. and Gomer Berry (Lords Camrose and Kemaley, q.v.) in 1937 divided their interests. Lord Camrose owns the *Daily Telegraph*; and Lord Kemaley the *Daily Graphic*, *Sunday Times*, *Sunday Graphic*, *Sunday Chronicle*, and sev. prov. news-

papers. The Westminster Press Prov. N. Ltd., formerly known as the Starmer group, controls four morning, nine evening, one Sunday, and nearly thirty co. weekly N., all these being mainly in the Midlands, Durham, and Yorkshire. But the Brit. press shows most conceivable types of ownership. Most London N. used to be family properties and many prov. N. still are. *The Times* since 1922 has been held by Lt.-Col. J. J. Astor and John Walter (see TIMES, TRK), but to prevent the paper from falling into undesirable hands the owners entered into an arrangement whereby any transfer of shares in the Times Holding Company requires the consent of a body of trustees consisting of the lord chief justice, the president of the Royal Society, the governor of the Bank of England, and others. The controlling interest in the *Daily Express*, *Evening Standard*, and *Sunday Express* is held by Lord Beaverbrook (q.v.). The *Daily Herald* is owned as to 49 per cent of its shares by the general council of the Trades Union Congress and as to 51 per cent by Odhams Press Ltd., who own entirely the *Sunday People*. The *News of the World*, credited with the largest circulation in the world, is the sole N. pub. by its owners. The *Daily Mirror* and the *Sunday Pictorial* are owned by interlocked companies. The *News Chronicle* and the *Star* are owned by the Cadbury family, the *Observer* by Viscount Astor, now under a trust formed in 1945; and *Reynolds News* by the Co-operative movement. The *Morning Advertiser* is the one example of a newspaper owned on behalf of a trade—the Licensed Victuallers. The *Daily Worker* is the organ of the Communist party.

Since the Franco-Ger. war the Amer. press has greatly influenced Brit. and European journalism. The use of the electric telegraph was without doubt first proved by Amer. correspondents in Europe at this time. A number of circumstances—the cheapening of paper, the development of setting and printing machinery, the reproduction of photographs to illustrate news items, and the establishment of powerful news agencies—tended to make N. in the U.S.A. of greater influence. It was also found convenient by wealthy men to be able to control a newspaper or syndicate of N., for their own political or social advantage. The first Amer. newspaper was pub. in Boston, Massachusetts, under the title of *Public Occurrences*; two copies were issued, 1689 and 1690; both were suppressed by the gov. of Massachusetts. Next was the *Boston News Letter* (1709), followed by the *Boston Gazette* (1719). Further Massachusetts N. were the *New England Courant* (1721), *Massachusetts Spy* (1770), and the *Boston Sentinel* (1784). The *Liberator* of Wm. Ll. Garrison was pub. in Boston, 1831. Among modern Massachusetts N. may be mentioned the *Boston Record and American Post* (1831); *Herald* (1846); *Daily Globe* (1872); and the *Christian Science Monitor* (1908). The prin. N. in New York include *New York Journal* and

American (1788); *New York Post* (1801); *World-Telegram, P.M.*, and *Sun* (1833); *New York Mirror*, *New York Herald-Tribune*, and *New York Times* (1851); and *Wall Street Journal* (1882). Chicago N. include *Chicago Tribune* (1847); *Herald-American* (see *HEARST*), and *Chicago Daily News* (1875); and *Chicago Sun-Times* (1929). As an example of the growth of N. may be mentioned those in Pennsylvania, including *Pittsburgh Press* (1824); *Philadelphia Inquirer* (1829); *Philadelphia Bulletin* and *Bulletin* (1847); *Altoona Mirror* (1874); *Public Ledger* (1914); *Philadelphia Daily News* (1925); and *Pittsburgh Post-Gazette* (1927). Ohio N. include *Cincinnati Enquirer* and *Cleveland Plain Dealer* (1841); and *Cleveland Press* (1878). Other well-known N. include the Kansas City *Star-Times* and *Detroit Free Press* (1831); *Baltimore Sun* (1837); *Washington Post* (1877); and *Los Angeles Illustrated Daily News* (1895). In the U.S.A. there are 1769 Eng. language daily N., with a combined sale of 51,673,000; 511 Sunday N. with 45,950,000; and 8381 weekly N. with 13,245,000. Amer. N. with very few exceptions, do not have a nation-wide circulation, and indeed they are not designed for that purpose. The exceptions are the *New York Times* and the *New York Herald-Tribune*, which circulate into the Far W., even as far as California. The largest circulations (1948) are *New York Daily News* (2,402,300, Sunday 4,716,800); *New York Mirror* (1,054,265, Sunday 2,206,200); *Chicago Tribune* (1,031,900, Sunday 1,544,800); *Philadelphia Bulletin* (771,300, Sunday 630,500); and *Philadelphia Inquirer* (704,900, Sunday 1,056,400). Important Canadian N. include the *Halifax Herald and Mail* (1878); *Montreal Gazette* (1878); and the *Toronto Globe and Mail* (1844); *Evening Telegram* (1876); and *Star* (1892).

Radio-facsimile Newspapers.—Transmission of news by radio facsimile has made some progress in America since the Second World War. Before the war miniature N. were transmitted by nearby radio stations during the night and printed by a small unit fixed in place of a loud-speaker to an ordinary radio set which contained a device to shut off the machine automatically. By 1939 about a score of radio stations had estab. regular radio facsimile service. During the war these experiments had to yield to war work, though the armed services used the radio-facsimile process for transmitting orders. W. G. H. Finch is the pioneer of this process in America. The Finch transmitter consists of a scanning machine into which copy to be broadcast is inserted. The copy, printed or typewritten or drawn, is automatically wrapped round the surface of a spinning cylinder. Beside the cylinder is mounted a device called the scanning head, which consists of an electric bulb, lens system, and photo-electric cell. The lens focuses a spot of light which traces a closely spaced spiral line on the surface of the paper. This causes the lights and darks of the copy, made by letters or pictures, to reflect from the paper with the varying intensity of the

photo-electric cell. From this impact of reflected light issues a high-pitched soft note, known as the facsimile carrier, which is applied to an ordinary amplifier and delivered to the radio transmitter in the same way as if it issued from a studio microphone instead of from a photo-electric cell. The home receiver picks up these signals and passes them to the attached recorder instead of to a loud-speaker. The recording instrument prints the incoming news and pictures on a continuous sheet of electro-sensitised paper, which reacts to the facsimile signal and shuts itself off when the printing is completed. It is now possible to use paper five columns wide, the size of a small newspaper, and to transmit at the rate of 48 sq. in. a minute or more than 550 words of copy. An entire four-page small-size newspaper has been transmitted in 8 min. Departmental stores have used the radio facsimile to send illustrations and copy in their advertisements directly into the home. It is possible to equip ships at sea with the service. One present difficulty is that it is not yet possible to transmit the regular eight-point type size clearly. The twelve-point type, which is used, cuts down the number of words the paper can carry. Another difficulty is the high cost of the electrolytic paper required for radio-facsimile transmission. It is feared by some that even greater standardisation and monopolisation of news production may result from radio-facsimile N. But the fear that radio facsimile may make the regular newspaper obsolete is considered groundless.

Royal Commission on the Press, 1947.—In response to a persistent demand of its supporters, the govt., in 1946, allowed a private member of the Labour party to bring forward a motion asking for the appointment of a royal commission to inquire into the finance, control, management, and ownership of the press. The chairman of the commission, appointed in 1947, was Sir David Ross, provost of Oriel College, Oxford. The other members were M. E. Aubrey, general secretary of the Baptist Union; John Benstead, general secretary of the National Union of Railwaymen; Neil Beaton, chairman of the Scottish Co-operative Wholesale Society; Lady Violet Bonham-Carter, president of the Liberal party organisation; R. C. K. Ensor, historian and journalist; Elwen Mary Owen, deputy regional commissioner for Welsh civil defence region during the Second World War; Hubert Hull, lawyer; J. B. Priestley, author; Wright Robinson, former lord mayor of Manchester; Gilbert Granville Sharp, recorder of King's Lynn; Lord Simon of Wythenshawe, chairman of the council of Manchester Univ.; Sir Geoffrey Vickers, legal adviser to the National Coal Board; Sir George Waters, formerly editor of the *Scotsman*; H. W. Wilson, chartered accountant; Barbara Wootton, reader in social studies, London Univ.; and G. M. Young, historian and author. The terms of reference were: 'With the object of furthering the expression of opinion through the press and the greater

practicable accuracy in the presentation of news, to inquire into the control, management, and ownership of the newspaper and periodical press and the news agencies, including the financial structure and monopolistic tendencies in control, and to make recommendations thereon.'

The report of the commission was issued on June 29, 1949. The most important recommendation was for the establishment of a general council of the press. It was proposed that this council should consist of at least twenty-five members representing proprietors and editors and other journalists and should have lay members amounting to about 20 per cent of the total. The lay members should be nominated by the lord chief justice and the lord president of the court of session, in consultation with the chairman, and should be entirely independent of the gov. of the day. The objects of the council should be 'to safeguard the freedom of the press; to encourage the growth of the sense of public responsibility and public service among all engaged in the profession of journalism — that is in the editorial production of newspapers — whether as directors, editors, or other journalists; and to further the efficiency of the profession and the well-being of those who practise it.'

Regarding chain N. the commission thought that such N. should carry a front-page formula indicating their common ownership; but concerning the allegations about monopoly, due to the growth in the series of chains, the assertion that the process had gone so far that a monopoly existed and that the chains were deliberately driving independent N. out of existence, was wholly disproved by the commission's findings. Of the five chains (Prov. N. Ltd., Harnsworth chain, Associated N. Ltd., Westminster Press Prov. N. Ltd., and Kemsley N. Ltd.), the Kemsley is the largest, its percentage of the total number of daily and Sunday papers being 17.18 in 1948. There were fewer daily and Sunday N. in the five chains in 1948 than in 1929. With the exception of two papers, whose lack of success could be attributed to other causes, no independent daily competing with a chain daily had ceased pub. since 1932. The commission found that the present degree of concentration of ownership in the press as a whole or in any important part of it 'is not so great as to prejudice the free expression of opinion or the accurate presentation of news, or to be contrary to the best interests of the public.' It was suggested in evidence that individual or joint stock ownership should be prohibited and papers be owned by gov.-licensed corporations. This the commission rejected as an 'unwarrantable interference with the liberty of the individual and the freedom of the press.' The commission saw no reason to believe that N. attached to the interests of political parties, trade unions, or other organisations would be better or have greater regard for truth and fairness

than those N. pub. by private undertakings. It is generally agreed, the report states, that the Brit. press is inferior to none in the world. 'It is free from corruption; both those who own the press and those who are employed on it would universally condemn the acceptance or soliciting of bribes.'

It has been claimed that the report of the commission was a complete vindication of the press generally. But the commission gave reasons why in their opinion N., with a few exceptions, failed to supply the electorate with adequate materials for sound political judgment. On this the report stated: 'In the popular papers consideration of news value acts as a distorting medium even apart from any political considerations: it attaches, as we have shown, supreme importance to the new, the exceptional, and the "luminous" and it emphasises these elements in the news to the detriment or even exclusion of the normal and the continuing. Consequently the picture is always out of focus. The combination, day after day, of distortion due to these factors with the distortion arising from political partisanship has a cumulative effect upon the reader. It results, where it is carried furthest, not only in a debasement in the standards of taste, but also in a further weakening of the foundations of intelligent judgment in public affairs. Political partisanship alone, as we have indicated, deprives the citizen of the evidence on which conclusions should be based. Political partisanship in conjunction with a high degree of distortion for news value may lead him to forget that conclusions are, or should be, grounded on evidence.' Discussing the standards by which the press should be judged, the commission sets down two requirements, firstly, that while the selection of news may be affected by a newspaper's political and other opinions the news it reports should be reported truthfully and without excessive bias; and, secondly, that the number and variety of N. should be such that the press gives an opportunity for all important points of view to be effectively presented. The first requirement is satisfied in very different measure by different papers. A number of quality papers do fully or almost fully meet its demands. But all the popular papers and certain of the quality fall short of the standard achieved by the best, either through excessive partisanship or through distortion for the sake of news value. The provincial newspapers generally fall short to a lesser extent than the popular national newspapers. As to the second requirement, the press provides for a sufficient variety of political opinion but not for a sufficient variety of intellectual levels. The gap between the best of the quality papers and the general run of the popular press is too wide, and the number of papers of an intermediate type is too small. The causes of these shortcomings do not lie in any external influences upon the press (other than those exerted by public demand). The policy of the press is

dictated neither by the advertisers, nor by the government, nor by any outside financial interests. . . . Nor do the causes of the shortcomings lie in any particular form of ownership. . . . We do not see a solution to the problems we have indicated in major changes in the ownership and control of the industry. Free enterprise is a prerequisite of a free press, and free enterprise in the case of newspapers of any considerable circulation will generally mean commercially profitable enterprise.' See also JOURNALISM; MAGAZINES; PRINTING.

See L. N. Flint, *The Conscience of the Newspaper*, 1925; A. Robbins, *The Press*, 1928; T. Clarke, *My Northcliffe Diary*, 1931; S. Morrison, *The English Newspaper, 1622-1932*, 1932; K. von Stutterheim, *The Press in England*, 1934; A. J. Cummings, *The Press*, 1936; H. W. Nevinson, *Fire of Life*, 1936; J. Soames, *English Press*, 1937; R. Christingen, *Le Développement de la presse*, 1944; E. Howe, *The London Compositor: Documents relating to Wages, Working Conditions, and Customs of the London Printing Trade, 1785-1900*, 1947; I. Rothenberg, *The Newspaper*, 1947; Kingsley Martin, *The Press the Public Wants*, 1947; Viscount Camrose, *British Newspapers and their Controllers* (revised ed.), 1948; A. Aspinall, *Politics and the Press, 1780-1850*, 1949; and W. A. Bagley, *Illustrated Journalism*, 1949. Ann. reference guides to the Brit. press include Willing's *Press Guide*.

New Stars, see NOVA.

New Statesman and Nation, independent Eng. weekly periodical formed in 1931 by the amalgamation of two papers, the *New Statesman* and the *Nation* and *Athenaeum*. In 1934 the *Week End Review* was also taken over and its name now appears as a sub-title to the *N. S. and N.* The *New Statesman* was founded in 1913, through the inspiration of Sidney Webb (later Lord Passfield) and Bernard Shaw. The paper was ed. from 1913 to 1930 by Clifford Dyce Sharp and thereafter has been ed. by Kingsley Martin. Among many well-known contributors have been Arnold Bennett, Desmond MacCarthy, Sir J. C. Squire, Hilary Belloc, G. D. H. Cole, and Robert Lynd ('Y. Y.') The *Nation and Athenaeum*, with which the *New Statesman* combined in 1931, was founded in 1907, superseding the *Speaker* (founded 1890), and was ed. until 1923 by H. W. Massingham (q.v.). In politics the *Nation* followed the *Speaker* in supporting the extreme radical wing of the Liberal party, in urging the need of social reform, and in criticising imperialism. In 1921 the paper amalgamated with the *Athenaeum* (q.v.); J. M. (later Lord) Keynes frequently wrote in its columns, while its literary section was remarkable for the essays of Leonard Woolf, literary editor, and the contributions of Lytton Strachey and Virginia Woolf. The present combined paper, the *N. S. and N.*, is a political, critical, and literary organ, markedly to the Left in politics.

Newstead: 1. VII. of Roxburghshire, Scotland, on the Tweed, 1 m. E. of Mel-

rose. Remains of a Rom. camp were excavated here in 1910. Armour and weapons were also found, and Rom. coins dating from the reign of Augustus to that of M. Aurelius. 2. Par. and vil. in Nottinghamshire, England, 9 m. N. of Nottingham, near the outskirts of Sherwood Forest. Its famous abbey was founded by Henry II. in the latter half of the twelfth century, and it was granted by Henry VIII. to the Byron family, who held it until 1818, when the sixth Lord Byron (the poet) sold it. It has since been restored at a cost of about £100,000. See W. Irving, *Abbotsford and Newstead*, 1835.

New Stone Age, see under STONE AGE.

Newt, Est. Asker (*Triton*), genus of tailed amphibians of the order Salamandrinae. Three species occur in Britain, viz. the common or spotted N. (*T. vulgaris*), the



NEWT

great or crested N. (*T. cristatus*), and the rare webbed N. (*T. palmatus*). Of them, the crested N. is the most aquatic. Its head is flat and the upper lip overhangs the lower one. The upper parts of the body are blackish-brown with darker brown spots. The under parts are reddish-orange, with black spots. The sides are dotted with white, and in spring the colours of the rough skin brighten and the notched crest comes into prominence. The male reaches a length of 5 or 6 in., while the common N. rarely exceeds half that length and the skin is smooth, though its colouring resembles the other.

New Testament, Introduction to the, forms a considerable section of biblical criticism, and as such must be considered in regard to the whole (see BIBLE). The fixing of the canon of the N. T. (i.e. determining which of the sacred writings are to be taken as divinely inspired) was the work of some centuries, and before this took place there was much research of the kind that would now come under the head of N. T. introduction. Certain books were held as canonical in some places; in other places they were ignored. In

the discussion which ensued as to the canonicity of such books, judgment was almost invariably based on historical grounds. Were those books for which apostolic authorship was really apostolic? Similar defence of the canonical books was also needed against the attacks of heretical sects. Thus we find many statements on points relating to N. T. introduction in such writers as Irenaeus, Tertullian, and especially Origen. A large number of the problems which confront the critics of to-day were not unknown to the fathers of the early Church. The canon, which had been accepted for centuries upon the authority of the Church, was disputed by the Protestant reformers, who rejected certain books. The old canon was confirmed by the Council of Trent. The early reformers, Erasmus, Luther, and Calvin, all expressed opinions on the authorship and value of certain of the N. T. books differing from the traditional views and calculated to support the new beliefs; but it is to a Catholic that we owe the true foundation of the study of biblical introduction. In 1689 Richard Simon, a Fr. theologian, pub. his *Histoire critique du texte du Nouveau Testament*, followed in the next year by an *Histoire critique des variantes du Nouveau Testament*. He deals with the N. T. with the object of vindicating the traditional view. Many critical introductions to the N. T. appeared in the years that followed—in England, France, and Germany; but the next epoch in the study of this subject is marked by the names of Michaelis and Semler. The former pub. in 1750 his *Einführung in die politischen Schriften des Neuen Bundes*, which was much improved in the fourth ed. (1788). He shows much breadth of view, dealing with the questions of inspiration and authenticity. Semler wrote no definite *Einführung*. His contribution to N. T. criticism lies in his insistence on the distinction between the temporal and universal elements in the N. T. From the time of Michaelis and Semler the study of N. T. introduction has been carried on by Ger. scholars. Only the most important can be named. J. G. Eichhorn in 1804–14 pub. the first three vols. of his *Einführung in das Neue Testament*, and the two remaining ones appeared in 1827. It is a brilliant work, but few of its results have been finally accepted. It is of less importance than the work of W. M. L. de Wette, whose *Lehrbuch der historisch-kritischen Einleitung in die Kanonischen Bücher des Neuen Testaments* appeared in 1826. The first ed. of this work was characterised by a very anti-traditional attitude. This, however, is changed to some extent in later eds. A work equally famous for its full but bold expositio is K. A. Credner's *Einführung in das Neue Testament*, 1838. But like Eichhorn, Credner is too hasty in formulating his theories. In 1842 appeared Reuss's *Geschichte der heiligen Schriften des Neuen Testaments* (last ed., 1887), a work still of the greatest value in the investigation of the problems of biblical criticism. Most of these writers, especially de Wette, occupy

a position more or less opposed to that of the Tübingen school, whose head was F. C. von Baur. He pub. a number of works on the N. T. and early Church hist., in which he definitely assailed the historicity of the canonical books. These he considered were to be regarded as more or less polemical treatises embodying the tendencies of the opposition parties in the early Church. One of these was the Judaistic, headed by Peter; the other, headed by Paul and ultimately victorious, was the Catholic party. All the N. T. writings were to be estimated in their relation to this struggle. The main thesis of the Tübingen school is now generally rejected, and its conclusions are discredited. One of the most convincing attacks on the Tübingen position came from a former disciple of Baur, A. Ritschl, in the second ed. (1857) of his *Entstehung der altkatholischen Kirche*. Reference must also be made in modern times to the introductions of H. J. Holtzmann, 1885; S. Lahm, 1897; A. Peake, 1909; J. A. Robinson, 1929; A. W. Blunt, 1936; A. Richardson, 1938; F. C. Syngo, 1941; and A. M. Hunter, 1945. On the Catholic side may be mentioned E. Jacquier, *Études de critique et de philologie du Nouveau Testament*, 1920, and *Histoire des livres du Nouveau Testament*, 1926; and introductions by A. S. Peake, 1909; J. Donovan, 1936; E. B. Redlich, 1939; and F. R. Hoare, 1944.

New Theatre, The, in St. Martin's Lane, London, was opened March 12, 1903, under the management of Charles Wyndham. The following are among the best-known plays produced at the N. T.: *The Constant Nymph*, 1926; *Richard of Bordeaux*, 1932; *Noah*, 1935; *The Gioconda Smile*, 1948. Between 1935 and 1947 the N. T. was the scene of several notable Shakespearian productions with Laurence Olivier and John Gielgud in the title roles.

Newton, Alfred (1829–1907), Eng. ornithologist, b. at Geneva. In 1854 he was elected travelling fellow of Magdalene College, Cambridge, and visited many parts of the world. He pub. *Zoology of Ancient Europe* (1862); *Ootheca Wallacea* (1864–1902); *Zoology* (1872); and a *Dictionary of Birds* (1893–96).

Newton, Sir Charles Thomas (1816–91), Eng. archaeologist, b. at Bredwardine in Herefordshire. In 1852 he became vice-consul at Mytilene, and in 1853–54 consul at Rhodes. In 1854–55, aided by funds supplied by Lord Stratford de Redcliffe, he discovered an important series of inscriptions at the is. of Calymnos, and in 1856–57 he discovered the remains of the Mausoleum at Halicarnassus. In 1861 he was appointed keeper of Gk. and Rom. antiquities at the Brit. Museum.

Newton, Gilbert Stuart (1794–1835), Eng. painter, b. at Halifax, Nova Scotia. He first exhibited at the Royal Academy in 1818, becoming an associate in 1829, and an academician in 1832. His pictures include 'Don Quixote in his Study' (1823); 'Captain Macheath upbraided by Polly and Lucy' (1826); 'Yorick and the Grisette' (1830); and 'Portia and Bassanio' (1831).

Newton, Sir Isaac (1642-1727), Eng. mathematician and scientist, b. in the manor-house of Woolsthorpe-by-Colsterworth, near Grantham, Lincolnshire, on Dec. 25, posthumous son of a farmer, Isaac N., and Hannah Ayscough. Educated at the King's School, Grantham, and entered Trinity College, Cambridge, in June 1661, graduating in 1665. His great discoveries of the differential calculus, the discovery of the composition of light, and the law of universal gravitation were all made in his twenty-third and twenty-fourth years while he was spending an enforced vacation at home owing to an outbreak of the plague. Returning to Trinity College he was elected a fellow, took his M.A. degree, and in 1669 was appointed Lucasian



SIR ISAAC NEWTON

Engraving after the original picture by Vanderbank, in the possession of the Royal Society.

prof. of mathematics in succession to his teacher, Isaac Barrow. His election as a fellow of the Royal Society in Jan. 1672 led to controversies extremely wearisome to N. Previous to this, from 1665 to 1667, he was engaged largely in mathematics, having studied Descartes's geometry, and invented the binomial theorem, the method of tangents, and the fluxional calculus (the discovery of fluxions, which he claimed, was contested by Leibniz, and led to a long and bitter controversy between the two philosophers), his paper *Analysis per Equationes Numeri Terminorum Infinitas* leading to his professorship. In 1668 his thoughts were directed by the falling of an apple, according to Voltaire, to universal gravitation. From Kepler's second law he deduced the law of inverse squares, and applied it to the motions of the moon; but did not complete his verification till he had Picard's new value (69.1) for the length of a degree of lat., which was found in 1672. In 1684 he wrote *De Motu*, which was presented to the Royal Society. This was the germ of his great work, and with additions formed the first book of his

Philosophia Naturalis Principia Mathematica, written 1685-86, during which time he was in constant correspondence with the astronomer royal, Flamsteed, chiefly on the subject of measurements of planetary orbits. The whole work was pub. in 1687. In 1689 N. was elected to represent his univ. in the Convention Parliament. During 1692-93 he passed through a period of serious illness, with loss of appetite and marked insomnia. He was at last, in 1694, largely owing to the efforts of John Locke, appointed by Charles Montagu, warden of the Mint, and three years later master. The year 1701 saw him again in Parliament, but he was defeated at the polls in 1705. He became president of the Royal Society in 1703, and was annually re-elected for the remainder of his life. He was knighted by Queen Anne in 1705. His *Optics* was pub. in 1704. A very prolonged controversy took place between N. and Leibniz, as to priority of claim to the invention of the new calculus. In 1714 N. gave evidence before a committee of the House of Commons on the question of finding longitude at sea. He was interested in theological studies and the auct. prophecies. After his death his *Observations upon the Prophecies of Daniel and the Apocalypse of St. John* and his *Chronology of the Ancient Kingdoms Amended* were pub., but nothing explicit concerning his views on the Trinity, which were believed to be Aryan and unorthodox, ever appeared. Amongst his great friends must be reckoned Halley, who persuaded and cajoled N. into writing his *Principia*; had not Halley exercised the greatest tact, the crowning part of the book would have been suppressed by N., for fear of controversy. Yet the work has been described as the supremefeat of the human intellect, for it contains not only the explanation of the planetary orbits, worked out in terms of universal gravitation and N.'s laws of motion, and of the behaviour of comets, but a host of other achievements of the first importance. It also gives the basis of mathematical physics, in particular of the science of fluid movements. It has been remarked that science was N.'s supreme interest only for short and separated periods, and in the intervals he displayed not only a lack of interest in physical science but sometimes even an actual distaste for it. It is certainly significant that he made no attempt to publish his great discoveries of the calculus, universal gravitation, and prismatic decomposition of light, and nothing on the calculus or on gravity appeared for some twenty years. N., far from being a man of remote academic interests, had a very practical mind. In his boyhood he made mechanical toys, clocks, and sundials. His interest in chem. began when he was boarding at the house of the apothecary, Clark, during his schooldays in Grantham, and this interest continued after he went to Cambridge. He took his chem. from Baptist van Helmont (q.v.), who discovered the materiality of gases, and from Boyle. The views in the *Principia* are akin to those of Boyle,

Hooke, and Mayow on the existence of a vital constituent in the atmosphere, isolated by Priestley long afterwards and named oxygen by Lavoisier. In 1692 he drew up a paper, entitled *De natura acidorum*, dealing with chemical affinity (pub. 1710), but it was in the queries appended to his *Optics* that he approached this problem more closely. Though he achieved the unique triumph of formulating the mathematical law of gravitational attraction, he was not able to extort from nature the laws of chemical attraction or to reach any corresponding simple numerical relationship. This problem is in fact one of far greater difficulty, because the attraction varies with the chemical nature of every reactant instead of with mere mass; and even today we cannot claim that progress in this problem reveals anything really satisfactory. Yet it seems that here was the great object of N.'s chemical speculations and researches and that 'here in the microcosm of chemistry he sought to parallel his discoveries in the macrocosm of mechanics' (Douglas McKie). N. was welcomed at the court of George I. and held in increasing reverence and honour — though his mind shrank from contact with the world. He d. at Kensington and was buried in Westminster Abbey near the entrance to the choir. Among Eng. scientists he stands foremost, and he left such a mark upon science that, until the beginning of the twentieth century, what was done in celestial mechanics and in general investigations of the properties of matter followed the lines he laid down (Andrade). See S. Horsley, *Isaaci Newtoni Opera quae extant Omnia*, 1779; Sir D. Brewster, *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, 1853; G. J. Gray, *Bibliography of Sir Isaac Newton*, 1907; and L. T. More, *Isaac Newton*, 1934. In 1942 (trecentenary) the Royal Society (of which N. was president for twenty-five years), with the financial help of the Pilgrim Trust, acquired N.'s bp. at Woolsthorpe-by-Colsterworth for the nation. The room in which N. was b. has a simple marble tablet on the wall, inscribed with Pope's well-known couplet.

Newton, John (1725-1807), Eng. divine and friend of Cowper, b. in London. First a sailor and slave-trader from 1755 to 1760, he was tide surveyor at Liverpool. In 1758 the archbishop of York refused him ordination, but in 1764 he was ordained by the bishop of London; he was curate of Olney till 1780, when he became rector of St. Mary Woolnoth, Lombard Street, London. With Cowper, he pub. *Olney Hymns* in 1779. See J. Bull, *John Newton: an Autobiography and Narrative*, 1868; and *John Newton: Centenary Memorials*, 4d., by J. Callis, 1908. There is also a contemporary life by R. Cecil, dated 1808, which was prefixed to a collected ed. of N.'s works, 1816.

Newton, Thomas (1704-82), bishop of Bristol, b. at Lichfield. He was ordained in 1730. After holding various minor appointments he became bishop of Bristol in 1761. He ed. Milton's *Paradise*

Lost (1749), and pub. *Dissertations on the Prophecies* (1754, 1758).

Newton: 1. Tn. of Scotland in Mid-Lanarkshire, 5 m. N.W. of Hamilton. Pop. 5000. 2. Suburb of Auckland, N. Is., New Zealand. Pop. 3500. 3. City of Massachusetts, U.S.A., in Middlesex co., on the Charles R., 10 m. W. of Boston, and a residential suburb of that city. There are foundries and machine factories, and manufs. of electrical apparatus. Pop. 70,000. 4. City of Kansas, U.S.A., and the cap. of Harvey co., 30 m. N. of Wichita. There is a Mennonite settlement here. The trade is chiefly agric. Pop. 12,000.

Newton Abbot, seaport and mrkt. tn. of Devonshire, England, on the estuary of the Teign, 20 m. S.W. of Exeter. There are large engine works here, and there is some trade in shipping. Pipeclay and fine china clay are obtained in the neighbourhood. William of Orange was proclaimed king of England here, at the market cross in 1688. Bindley Manor, W. of the tn., is an admirable specimen of fifteenth-century architecture on the shell scale. Pop. 15,000.

Newton Grange, vil. N.E. of Edinburgh, Scotland, 2 m. S. of Dalkeith, with coal mines, brick and tile works, paper mills, etc. Pop. 5000.

Newton Heath, tn. of Lancashire, England, 1½ m. N. of Manchester, on the Medlock. There are cotton mills, and dye, bleach, and chemical works. It is a suburb of Manchester.

Newton-in-Makerfield, or **Newton-le-Willows**, urban dist. and tn. of Lancashire, England, 15 m. E. of Liverpool. The Liverpool farm reformatory school is here, with a farm and market gardens. There are iron foundries, glass factories, sugar refineries, and printing and stationery works, paper mills, etc. Coal is mined in the neighbourhood. Pop. (1938) 20,460.

Newton's Rings. Set of concentric circular interference fringes formed around the point of contact when the convex surface of a lens rests on a plane polished surface. Newton took two lenses of very slight curvature, so arranged as to enclose, when pressed together, a film of air, thinnest near the centre and thickening gradually outwards. On pressing, a number of concentric coloured rings appeared, varying in number and arrangement, but all exhibiting colours of the spectrum; the centre of the rings when the glasses were in contact was black. With white light the number of rings is seven, and the colours are arranged from violet to red outwards. When the light is transmitted instead of reflected, the colours are complementary and the black spot becomes white. The convex surface being pressed on the plane surface of the lower lens encloses a film varying from $\frac{1}{100}$ to $\frac{1}{1000}$ in. in thickness outward, the thickness varying as the square of the distance from the centre. The light is reflected from each surface and arrives at the eye, having traversed paths differing minutely in length. The rays, which are reflected from the upper and lower surfaces, are thus seen simultaneously

in the same phase or opposite phases, so producing interference, destruction, or reinforcement. The different colours produce their effects at different distances from the centre, and by measurement the actual wave-length may be determined.

Newton Stewart, mkt.-tn. of Scotland, in the co. of Kirkcudbright and Wigton, on the R. Cree, 6½ m. N.N.W. of Wigton. Cattle markets and horse fairs are held. Pop. 2000.

Newton-upon-Ayr, suburb of Ayr, Scotland. Pop. 10,000.



Agent General for British Columbia

THE PATTULLA BRIDGE OVER THE FRASER RIVER AT NEW WESTMINSTER

Newtown: 1. Manufacturing tn. of N. Wales, in the co. of Montgomery, 8 m. S.W. of the tn. of that name on the r. b. of the Severn, and on the Montgomery Canal, which connects it with the inland navigation of the country. It is the centre of the flannel manuf. of the co. Pop., with Llanllwchfaearn, 3,200. 2. Tn. of New S. Wales, Australia, in Cumberland, 3½ m. from Sydney, and principally a residential suburb of that city. The univ. buildings and colleges are here. 3. Suburb of Hobart, Tasmania.

Newtownards, tn. of co. Down, N. Ireland, near head of Strangford Lough. Embroidered muslin, gingham, and handkerchiefs are manufactured. In the neighbourhood are the ruins of Moville Abbey. Pop. 12,000.

Newtown Hamilton, par. and mkt.-tn. of co. Armagh, N. Ireland, 11 m. W. of Newry. Pop. 3000.

New Towns, see under **SATELLITE TOWNS**.
Newtown Stewart, mkt.-tn. in co. Tyrone, N. Ireland, on the Mourne, 24 m. S. of Londonderry. Linen weaving is carried on. Pop. 1000.

New Ulm, city of Minnesota, U.S.A., and the co. tn. of Brown co., on the r. b. of the Minnesota R., 75 m. S.W. by W. of Minneapolis. It was founded in 1854 and destroyed by Indians in 1862; it has been well rebuilt since then. A trade in livestock is carried on. Pop. 8700.

New Westminster, tn. of Brit. Columbia, Canada, former cap. of the prov. on the

r. b. of the Fraser R., here crossed by a fine bridge. It is served by the Canadian National and Canadian Pacific Railway, and by the Great N. from the U.S.A.; an electric railway connects it with Vancouver, 12 m. E.S.E. N. W. was founded by the Royal Engineers in 1858 and incorporated in the same year. A fire occurred in 1898, when a large part of the city was destroyed. The fresh-water harbour is third among Canada's seaports, the chief exports being lumber, lead bars, ores, and fruit. Manuf. include wood products, paper, fertilisers, cordage, meat-packing, and canneries. Pop. 33,500.

New Year's Day has been celebrated in all parts of the world, and from remote antiquity with special festivities. The date of the commencement of the new year has, however, varied considerably. That of the anc. Egyptians and Persians commenced with the autumnal equinox (Sept. 1). The Jews (circles), and the Babylonians made it begin with the spring equinox. The Gks. (until the fifth century B.C.) celebrated it at the winter solstice. During the Middle Ages Christian countries almost invariably began the new year on March 25. According to the Julian calendar, the new year began on Jan. 1, and the Romans observed this day as a general holiday. Visits were paid and presents exchanged, the custom of giving presents being popularly derived from the time of the legendary King Tatius. The gifts were known as *strenæ* (*cf.* the name for N. Y. D. in France, *le jour d' Strennes*), and so great were the imperial *strenæ* that they ultimately became a subject of legislation. The early Christians were not expected to take part in either the new year's revels or the Saturnalia of Dec., and many of the fathers order N. Y. D. to be kept as a fast. But the need for this vanished, and even in England the custom of giving New Year's gifts continued down to the time of Charles II. It has now given way to the giving of Christmas presents.

New York Bay. The Lower (outer) Bay is that part of the Atlantic which washes the converging shores of Staten Is. and Long Is. Between these is, runs a strait called the Narrows, through which the Upper (inner) Bay is reached. This is some 6 m. long and 4 m. wide, and at its inner end are the mouths of the Hudson and East Rrs., with Manhattan Is. and New York City lying between them.

New York Central Railroad was started as a large railway combine in 1868. It is now one of the largest railways in America, and has a total mileage of 10,745; the main line runs from New York to Chicago, but it has important branch lines and connects with most of the E. states railway systems. In addition to its own lines, the company leases and operates 2632 m. of track. The total investment is over \$1,180,000,000. and the operating revenue (1948) over \$703,340,000.

New York, Chicago and St. Louis Railroad, important railway company operating 1687 m. of track in the busy N.E. areas of the U.S.A. It was incorporated in 1923 as an amalgamation

of sev. lines, including the New York, Chicago and St. Louis railroad; the Chicago and State line; the Toledo, St. Louis and Western; the Lake Erie and Western; and the Fort Wayne, Cincinnati and Louisville. It has an authorised capital of \$105,000,000 of which \$89,000,000 is issued and subscribed. At one time a large part of the line was operated by the New York Central Railway.

New York City originally was the ls. of Manhattan; but greater New York includes the boro. of Bronx, Brooklyn, Queens, and Richmond, and part of

length and very narrow), skyscrapers have been erected. The Empire State soars up eighty-five storeys, attaining a height of 1250 ft. and is the tallest structure in the world. Other notable ones are the Chrysler building; the Chanin Tower; the Woolworth building, being 792 ft. high; the Singer Co.'s building is 612 ft. high; the New York Telephone building in W. Street is 498 ft. high. Skyscrapers of from thirty-five to fifty-one storeys have now become a commonplace in N. Y. C. The Waldorf-Astoria hotel with its twin towers reaching over forty storeys is



Aerial Exploration Inc.

NEW YORK: A VIEW LOOKING SOUTH-WEST, SHOWING SOUTH MANHATTAN
Upper Bay is on the left; behind the skyscrapers are the River Hudson and Jersey City. In the foreground (East Side) is Manhattan Bridge; beyond it Brooklyn Bridge and the main financial district of Manhattan.

Westchester. New York disputes with London the claim to be the largest city in the world. Taking a radius of 25 m. New York is the centre of a large pop. It has more Gers. living in it than many large cities in Germany, more Irish than Dublin, and more Its. (mostly labourers) than most big It. cities. Every fourth person in New York is a Jew. Of the pop., over one-third are foreigners, females slightly predominating. There is also the great transitory pop., which is always a feature of large ports. Many Chinamen are engaged in laundry work. The Negro pop. is the largest of any city. The Jews are chiefly Polish and Russian. Swedes and Norwegians have each a strong colony in N. Y. C., and are prosperous, quiet, working citizens. Owing to the size of Manhattan Is. (12 m. in

the biggest hotel in the world. The New Yorker is another notable skyscraper hotel, reaching forty-two storeys. N. Y. C., is the great mart and exchange of the U.S.A., and is the commercial and financial metropolis of the States. The Stock Exchange, the building designed by George B. Post, and completed in 1922, is in Wall Street, a narrow street leading E. out of Broadway, which forms the central thoroughfare right through Manhattan, and across which run the avenues. The Fourth and Fifth Avenues were mostly residential and here were the palatial homes of the business kings, but in recent years many of the old houses have given way to commercial buildings, and the magnates have removed to Park Avenue or an hotel. The principal shopping dist. is from 32nd to 57th

Street, with bargain stores in 14th Street, Bowery, extending N. of Chat-ham Square, is a Jewish quarter, and the poorest part of the city. Two lines of railway have termini in Manhattan, the New York Central and the Pennsylvania. They have the two finest railway stations in the world. Many other lines have termini across the Hudson R., in New Jersey and convey their passengers to N. Y. C. by ferry. The elevated railway is a feature of the city, and there is a vast underground railway along the whole of Manhattan Is., and extending to the Bronx, the Brooklyn, and the Long Is. points. New York is the largest port in America, more than half the import and export trade of the U.S.A. coming by way of this city. New York harbour, formed by the North and the Hudson, consists of two bays, the Upper and Lower, divided by the Narrows, commonly called Hell's Mouth, and bounded on the S.E. by Raritan Bay, N.E. by Brooklyn and Long Is. Sound. The promontory of Sandy Hook with lighthouse is the first land sighted by European travellers. The enormous statue of 'Liberty enlightening the World,' by Bartholdi, stands on Bedloe's Is., and has a pedestal of 150 ft. The water communication of the Hudson R. and the Erie Canal is of the utmost importance, for much of the wheat sent from Chicago market is thus shipped through to Europe. Many of the piers are on the New Jersey side at Hoboken; others on the North R. The U.S. naval shipbuilding yards are on the Brooklyn side, where there are extensive docks and 36 m. of improved water-front. The ferries crossing the rvs. are of immense size. The city is noted also for its daily papers, over one-seventh of which are printed in foreign languages; two are in Yiddish. There are two univs.; Columbia Univ. was founded as King's College on the result of a public lottery in 1754. Its present site is on Morningside Heights and it includes the Barnard College for Women. New York Univ., the undergraduate dept. of which is on Washington Heights, was founded in 1831. It is a huge organisation and is divided into three centres, the undergraduate dept., the school in Washington Square, and the school of commerce in Trinity Place. The N. Y. C. College, whose new buildings were completed in 1900, has a policy of free education. Fordham (St. Francis Xavier) College has developed from a theological seminary into a complete univ. The People's Institute is a primary and adult evening school. The New York Public Library, estab. by consolidation of the Astor, Lennox, and Tilden foundations, was opened in 1911. The Bellevue Hospital Medical School is the largest medical school in America. There are over 550 churches: Trinity, at the head of Wall Street, Grace Church, the Church of the Transfiguration (Episcopal), the vast and costly cathedral of Saint John the Divine on Morningside Heights, St. Patrick's Cathedral (Rom. Catholic), Madison Square Church, Byzantine, with golden dome (Presbyterian),

and the fine Jewish synagogue, are all notable.

As most business from the nineteenth century centred in Manhattan Is., and as the whole area was very narrow, the only way of expansion was in the air. Hence, after skyscrapers were invented, New York developed them to their highest pitch. The early ones, like the Pulitzer and Flat Iron buildings, to-day look almost like pygmies compared with those erected subsequently. In order to provide for light and air, the new building laws require the step-back or terraced form of building, which gives to these enormous structures something of a Babylonian aspect. The time is probably rapidly approaching when most of Manhattan will consist of skyscrapers. Wall Street section—the financial dist.—is filled with them. Another great group was constructed between 30th and 60th Streets, and many avenues are lined with them. There is one group devoted to the clothing and needle trades, another to medical schools and hospitals. Skyscraper hotels are the fashion in New York. Most of the modern ones range from eighteen to forty storeys high, and have from 750 to 2200 bedrooms, each with private bath. The vast working pop., accumulated in the skyscrapers during the day, has made the traffic problem the most difficult in the world. In the morning and evening the streets are congested with motor vehicles, the sidewalks with pedestrians travelling to trams or underground, there known as the subways. The city has not been able to build its subways fast enough to accommodate the crowds.

New York possesses at least two thoroughfares which are world famous—Broadway and Fifth Avenue. The latter, from which tramcars are barred, is the great retail, shopping, hotel, and club avenue. Broadway, between 25th and 60th Streets, is the centre of the theatrical and night life. It is the section known as the Great White Way, because of the vast series of electric advertising signs which almost turn night into day. In some aspects it is the city that never goes to sleep. Buses, tram-lines, subways, elevated trains, run all night; there are countless drug stores and restaurants which never close their doors, and there are cinemas which have performances which start at midnight. Central Park is 840 ac. in extent, and has many magnificent drives and walks. At the main entrance is a fine monument of Columbus. The Metropolitan Art Museum faces the E. side of the park. It is one of the greatest in the world and was greatly enriched by the princely legacies of Benjamin Altman and Henry Frick, both of whom bequeathed to it their priceless collections of old masters. The city frontage on the Hudson R. from 72nd Street northwards has been made into a beautiful scenic driveway, Riverside Park. On the Brooklyn side the prin. park is Prospect Park, famous for its gardens. That part of the city known as the Bronx contains the huge Bronx Park, in which is located

the New York Zoo, the richest and one of the largest and best equipped in the world. Manhattan is connected with Brooklyn by four enormous bridges besides the great Hellgate railway bridge which connects Brooklyn with the Bronx just above Harlem R. The Williamsburg Bridge is one of the greatest suspension bridges of the world, as also is the bridge between Manhattan and Fort Lee, New Jersey, with its suspension span of 3500 ft. But plans for a vehicular bridge to be constructed in New York Harbour over the narrows between Staten Is. and Brooklyn will necessitate a suspension bridge larger than any in existence. Its centre span of 4620 ft. will be 420 ft. longer than that of the Golden Gate bridge at San Francisco, now the longest, and 1120 ft. longer than the centre span of the George Washington bridge which crosses the Hudson R. from New York to New Jersey. At its highest point it will be 237 ft. above the narrows. The bridge is designed to carry a six-lane roadway with clover-leaf approaches to belt parkway in Brooklyn and main highways on Staten Is. It is expected that it will take four years, at least, to build the bridge, but some estimates run as high as ten years, while the cost is put at \$78,000,000. On Manhattan Is. the tendency is for private houses to become impossible except for people of wealth, and for the dense pop. to live in ever larger and more elaborate apartment houses. There are fine municipal buildings. N. Y. C. has a large domestic commerce, 10 per cent of the nation's products being manufactured there. The manufs. include clothing, printing products, millinery and lace goods, bakery products, tobacco, cigars and cigarettes, fur and knitted goods, boots and shoes, furniture, foundry and machine-shop products, and musical instruments. Brooklyn has its own industrial trades; it is a large grain depot, imports, refines, and distributes sugar, imports and distributes coffee, and manufs. boots and shoes. Pop. (1940) Manhattan 1,889,900; Brooklyn 2,698,300; Bronx 1,394,700; Queens 1,297,600; Richmond 174,400; total 7,454,900. See TAMMANY HALL.

History.—In 1609 Henry Hudson discovered the riv. named after him and also the Is. of Manhattan. In 1626 Peter Minuit, appointed director of Dutch colonies in America, arrived at Manhattan and bought the entire Is. from the Indians for twenty-four dollars' worth of beads and ribbons. To-day that Is. is the most valuable piece of land in the world. Thus began what was to be the modern Babylon. It was governed by Minuit and a council of five appointed by the Dutch W. India Company in Holland. The people had no voice in their gov. At first growth was very slow, and at the end of five years there were but 300 people living in the tn., which was named New Amsterdam. The home company, desiring to attract settlers, in 1629 adopted the patron system. Under this any member of the company who would bring or send at least fifty settlers, fifteen years

old or over, would be granted an estate of 16 m. of frontage on the Hudson R., and as far back as his resources would permit him to develop. The patron was bound to provide a farm for each of his tenants, who in their turn were bound to remain on it for ten years. The more powerful of these patrons became immensely wealthy, and in after years formed what was known as the Knickerbocker aristocracy of N. Y. C. It included such well-known names as the Van Alens, Schuylers, and Livingstons.

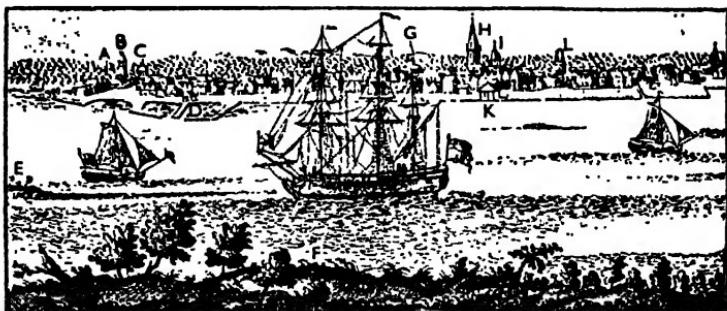
New Amsterdam now began to grow, and attracted people, not only from the Eng. colonies in America, but also from Europe, so that by 1643 some eighteen languages were being spoken there, and the future of N. Y. C. was thus already marked by a cosmopolitan character which was to make it unique. The famous Peter Stuyvesant, with his wooden leg, was the last Dutch governor of the settlement. Under him the restlessness of the people came to a head. They wanted a voice in their own gov., strengthened in this by what they saw going on in the neighbouring Eng. colonies. The home company finally decided that the governor should have a council of nine, chosen from a larger number selected by the people. But, nevertheless, he managed to keep things very largely in his own hands until fate eventually overtook him. In 1664, England claiming the colony on the ground of the Cabot discoveries, King Charles the Second presented the entire surrounding country to his brother, James, duke of York. Richard Nicolls of the R.N. set out with 500 veteran soldiers. On reaching New England, he was joined by Eng. colonial militia from Connecticut and sailed for the mouth of the Hudson. Stuyvesant wanted to fight but the people were not with him, and he was compelled to surrender the tn., which was at once named New York. Old Stuyvesant retired to his farm or 'bowery'—after which that famous dist. of N. Y. C. is named—and later became fast friends with Governor Nicolls. Nine years later a Dutch fleet reconquered New York, but the next year by peace treaty it was returned to the Eng. Under the Eng. N. Y. C. became a busy mart containing over 10,000 people by 1750.

In the late eighteenth century, before the revolution, New York had prospered and developed more than any other Amer. city, though both Philadelphia and Boston were equally important ports. New York owed its position to the fact that it was the natural outlet and cap. of the Middle Colonies (see on this J. Truslow Adams, *The Epic of America*, 1942). Already it had a more mixed and polished society than anywhere else in New England, though some historians claim that Boston far outstripped it as the literary cap. of the U.S.A. even as late as the first half of the nineteenth century, and that in the late eighteenth century it was rivalled by Philadelphia for commerce. John Adams, on his way to staid Philadelphia, was impressed by the

splendid houses, fine salons, and elaborate cuisines. At this period the city had its clubs, balls, concerts, pleasure-gardens, and coffee-houses. A funeral in New York sometimes cost several thousand dollars, and the wealthy people dressed in the latest London modes, with silks and velvets, powdered wigs, and small swords (see A. Nevins and H. S. Commager, *America*, 1943). There were grammar schools but no general system of instruction. King's College (now Columbia Univ.) trained Alexander Hamilton and Gouverneur Morris, but wealthy families sent their sons to the Brit. univs. At this time (1790) the pop. was 33,000, that of Philadelphia being 42,000, and of Boston 18,000. The year 1789 saw New York developing temporarily into a national cap., and President Washington at first occupied a residence just outside the city

estab. a type of pictorial joke, in which written explanation was reduced to a minimum and attention directed on the joke even at the cost of visual accuracy. This style has had great influence on comic art in America and Europe. The *N. Y.* has, from its first issue, maintained a frankly optimistic and boosterous outlook. It is the nearest Amer. counterpart to *Punch*, but possibly has a less national appeal, being particularly styled to suit the inhab. of New York city. It also contains rather more technical articles than are found in *Punch*.

'New York Herald Tribune.' The *New York Herald* was founded May 6, 1835, by James Gordon Bennett, in New York City. It was the first Amer. newspaper to make a feature of shipping, religious, and financial news. It sent H. M. Stanley to Africa in 1869. Under Bennett's son and



A, The Fort; B, The Chapel; C, Secretary's Office; D, The Great Dock; E, Part of Nutten Island; F, Part of Long Island; G, Dutch Church; H, English Church; I, City Hall; K, The Exchange; L, French Church

on Franklin Square and then later took an imposing mansion (McComb) in Lower Broadway, while Vice-President Adams occupied a large house on Richmond Hill. Congress sat both at Wall and Broad Streets. In the 1830s the new Amer. classes converted the city from a federated to a democratic city. To-day New York stands unchallenged as the marine, commercial, financial, journalistic, and literary metropolis of the New World. See J. G. Wilson, *Memorial History of the City of New York*, 1891-93; M. J. Lamb and B. Harrison, *History of the City of New York: Origin, Rise, and Progress, 1890*; Mrs. S. Van Rensselaer, *History of the City of New York in the Seventeenth Century*, 1909; —, Warshaw, *The Story of Wall Street*, 1930; E. W. Spaulding, *New York in the Critical Period 1783-89*, 1932; C. Beaton, *Portrait of New York*, 1948; and A. Nevins and J. A. Krout, *The Greater City—New York, 1898-1948*, 1948. 'New Yorker' literary and satirical U.S. weekly magazine, first issued in Feb. 1925. Its chief owner was Harold Ross, who also ed. it. It is pub. by the New Yorker Magazine Inc., whose offices are at 25 West 43rd Street, New York 18. It

heir it achieved wide circulation and fame. The paper was purchased by Frank A. Munsey in 1920, and merged with the *New York Sun*, the morning paper still being called the *New York Herald* and the afternoon paper the *Evening Sun*. In 1924 the *Herald* was purchased by the *New York Tribune* (q.v.) and merged with that paper under the title of *New York Herald Tribune*.

'New York Journal,' originally founded in New York City in 1733, became a daily in 1788. It had a chequered career until 1924 when it was bought by Wm. Randolph Hearst, who immediately deprived most of the other New York papers of their best brains by paying higher salaries. Hearst made of it a more or less sensational newspaper, which achieved a huge circulation and gave rise to the phrase 'yellow journalism.' It was largely due to the campaign of the *Journal* and other Hearst papers that the people of the U.S.A. were aroused to the point of forcing their gov. to make war on Spain in 1898.

New York, New Haven and Hartford Railroad Company was incorporated in 1872, and now operates 1819 m. of track (of which 127 m. is electrified) in one of the

most densely populated areas of the E. states of America. It has been part of the company's policy to operate all kinds of traffic, and in consequence it is proprietor of a large number of motor coaches and a fleet of steamboats, which not only act as feeders to the railway lines, but also enable the company to deal with the waterways and roads of the area.

New York State, most influential of the U.S.A., called the 'Empire State,' one of the original thirteen states, is three times the size of England. It is bounded on N.W. by Lake Ontario, N. by the prov. of Quebec, E. by Vermont, Massachusetts, Connecticut, S. by New Jersey, Pennsylvania, W. by Lake Erie. Land area 49,204 sq. m., 1550 being water. The beautifully wooded Adirondack Mts. are in the N., the Catskills in the E., Shawangunk Range in the S. Lake Seneca and Lake Cayuga are the largest of the Finger Lakes, a belt of lakes in W. New York, and both are about 40 m. in length. Lake Geneva is one of the prettiest. The beautiful George and Champlain lakes lie E. of the state. The famous Hudson R., with Mohawk trib., flows eastward and southward through this state alone, whilst the Delaware and Susquehanna rive. drain the central part. The Erie Canal, opened in 1825, connects the Hudson with the Great Lakes. The largest cities are New York, 7,454,900; Buffalo, 575,900; Rochester, 324,900; Syracuse, 205,900; Yonkers, 142,500; Albany (the cap.), 130,500; Utica, 100,500; Schenectady, 87,500; Binghamton, 77,000; Niagara Falls, 78,000; Troy, 70,300; Mount Vernon, 67,300; New Rochelle, 58,400. The state sends forty-three members to the lower house of Congress at Washington, and it is sometimes called the pivotal state, owing to its influence. Education is compulsory between seven and sixteen, and over 73,000 teachers are employed in the 6430 public schools. Unis. include Columbia, New York Univ., Cornell (Ithaca, New York, where state scholarships can be obtained), Syracuse (Syracuse), Rochester (Rochester), Buffalo (Buffalo), Colgate (Hamilton), Union (Schenectady), besides Fordham (New York City), Hamilton College (Clinton), College of City of New York (New York City), the Union Theological Seminary (New York City), the General Theological Seminary (New York City), Vassar (Poughkeepsie), Barnard College (New York City), for women, eight law schools, twelve medical schools. The chief religions are Rom. Catholic, Jewish, and Protestant Episcopal. The governor is chosen for four years. The Senate, which meets at Albany, is composed of fifty-six members, elected every two years, and the Assembly of 150 members, elected every two years, thirty-five being sent from New York City. There are sixty-two cos., five of which comprise the city of New York. Agriculture is good, and dairy-farming is extensive. Grapes, peaches, and other fruits are widely cultivated; the apple crop is second only to that of Washington. The state comes second in maple sugar, potatoes, and buckwheat.

Her manufactured products are worth well over \$7,000,000,000 a year. The leading industry in value of output is clothing manufs.; printing, publishing, and textiles are also enormous interests; other industries are fur goods, corsets, hats, millinery, gloves, and shoes. A considerable portion of the huge figures is accountable by the fact that New York City is the greatest manufacturing city in the U.S.A. Mineral resources are various, and include gypsum, talc, aluminium, zinc, salt, and emery. Cement, petroleum, and coke are produced, and there are natural gas yields. Mineral output in 1945 was valued at over \$90,000,000. In the state, excluding New York City, are 7955 m. of railway, and 199 airports. The climate is subject to extremes of heat and cold; the air is dry and invigorating.

New York Bay was discovered by Verrazano in 1524, and in 1609 Samuel de Champlain entered from Canada at the same time as Henry Hudson, sailing under the Dutch flag, reached New Amsterdam, the name first given to New York City. After much desultory fighting, Peter Minuit, in 1626, bought Manhattan Is. from Indians on behalf of the W. India Co. In 1664 Col. Nicolls took possession in the duke of York's name. In 1770 one of the preliminary skirmishes of the Amer. revolution took place in the streets of New York City, but was followed by peace until 1773, when news of the Boston 'Tea Party' aroused the 'Sons of Liberty' again. In 1775 a Prov. Congress met at New York City to elect delegates to the Continental Congress. During the Civil war between N. and S., party politics ran high, there being a strong anti-slavery feeling. Since 1860 the economic development has continued with uninterrupted smoothness. In 1882 the Labour party secured the passing of a Bill limiting hours of work for women and children. The state is the most populous of the U.S.A. Pop. 3,479,100 (Negro about 600,000). See J. R. Brodhead, *History of the State of New York, to 1891, 1871-72*; C. Z. Lincoln, *The Constitutional History of New York, 1906*; A. C. Flagg (ed.), *History of the State of New York, 1933-37*; and Federal Writers' Project, *New York: a Guide to the Empire State, 1940*.

New York State Barge Canal, see CANAL.

'New York Sun' was founded in New York City in 1833 by Benjamin Day, who wrote, ed., and printed the paper by himself. In 1868 it passed into the hands of Charles A. Dana, a brilliant, sarcastic, often sardonic editorial writer, who forced upon his staff a style of such high level that the *Sun* was for years the American newspaper man's bible. Dana maintained his own domestic and foreign news service, desiring to have accounts that were different from the highly standardised ones then sent out by news-gathering associations. He was succeeded by Wm. Laffan, who kept up the paper's high standard until his death in 1909. Frank A. Munsey bought the paper in 1916, merging the morning ed. with the *New York Herald* in 1920, but retaining the

Erening Sun. The 'N. Y. S.' ceased pub. in Jan. 1950, and was amalgamated with the *World-Telegram*.

'New York Times' was founded in New York City by H. J. Raymond in 1831. It had a chequered existence, and was rather moribund when Adolph S. Ochs, who had made a success with the *Chattanooga Times*, bought it in 1896. Ochs had the ideal of a Conservative paper which would never indulge in yellow journalism, and has adhered strictly to that programme. To-day the *Times* has its own special correspondents in all the great cities of the world. When Ochs became firmly seated in the saddle, to distinguish his paper from the yellow journs. he adopted the motto which is still printed on the first page, 'All the news that's fit to print.' The *Times* not only prints it, but does so *in extenso*. Its Sunday issue is enormous, averaging about 160 pages. In politics it is Democratic, but independent. See E. Davies, *History of the New York Times*, 1931.

'New York Tribune,' founded in New York City in 1841 by Horace Greeley, who remained its chief proprietor until 1872, when it was taken over by Whitelaw Reid as editor-in-chief and owner. Reid had served the paper as its chief correspondent during the Civil war. Under Reid the paper became the most stalwart Republican jour. of the E. With the development of Amer. newspapers, the *Tribune* was in the van with its huge Sunday ed. It also estab. an ed. Issued daily in Paris. Reid's son, Ogden Reid, succeeded him in control of the paper. In 1924 he purchased the *New York Herald* and issued the merged organs under the name *New York Herald Tribune*. This paper is the most widely-read Republican jour. in the country, and combines a progressive international, with a conservative domestic, outlook.

'New York World' was founded in New York City in 1860 and taken over by Manton Marble, who ed. it until 1883, when it was purchased by Joseph Pulitzer, who had made a success with a newspaper in St. Louis. Pulitzer 'shook up the journalistic dry bones' of the metropolis by the methods of the new journalism and 'stunts.' The paper soon achieved wide circulation. But there was a firmer foundation to its appeal to the public in that Pulitzer made of the jour. a great Liberal newspaper right in the heart of Conservative New York. In 1931 it was amalgamated with the *New York Telegram*, and became the *World-Telegram*.

New Zealand. The dominion of N. Z. consists of two large and sev. small ls. in the South Pacific. The ls. forming the dominion proper for general practical purposes are North Is., South Is., and Stewart Is., each with its adjacent islets, and Chatham Is. Outlying ls. included within the boundaries as proclaimed in 1847 are: Three Kings Is., Auckland Is., Campbell Is., Antipodes Is., Snares Is., Bounty Is., and Solander Is. Is. annexed to N. Z. are Kermadec Is. (annexed in 1887), Cook Is. and other Pacific Is. (both annexed in 1901). The Pacific Is. consist of Niue or

Savage Is., Palmerston Is., Penrhyn or Tongareva Is., Manahiki Is., Rakahanga Is., Pukapuka or Danger Is., Nassau and Suvarrow Is. The proclamation of Brit. sovereignty over N. Z. dated Jan. 30, 1840, gave the boundaries of what then constituted the colony, but these were changed by letters patent in 1847 and again by proclamation in 1901. The boundaries extend approximately from 33° to 53° of S. lat. and from 162° E. long. to 173° W. long. By a trusteeship agreement of the United Nations the N. Z. Gov. also now administers the pre-1920 Ger. possessions of W. Samoa; and, jointly with the United Kingdom Gov. and the gov. of Australia, holds the trusteeship over Nauru Is. In 1923, the coasts of the Ross Sea, with adjacent is. and ters., were declared a Brit. settlement under the British Settlements Act, 1887, and named the Ross Dependency. In 1925, the Union or Tokelan Is. were excluded from the Gilbert and Ellice Is. colony and put under the administration of the governor-general of N. Z., and later delegated to the administrator of W. Samoa. The total area of N. Z. (excluding mandated ter., Ross Dependency, and Tokelan Is.) is 103,723 sq. m.: North Is. and islets, 44,281 sq. m.; South Is. and islets 58,093 sq. m.; Stewart Is. and islets 670 sq. m.; Chatham Is. 372 sq. m. (total, dominion proper, 103,416 sq. m.); 'outlying' is. 307 sq. m.

Coast.—The coast-line of N. Z. is very long in proportion to its area. Since nearly the whole of the N. Z. land mass lies parallel to the direction of its mt. ranges it is not greatly indented and there are few natural harbours. Even where natural harbours do exist, like those on the E. coast of the North Auckland Peninsula, they are often of little economic consequence owing to their unfavourable situation. The only two safe natural harbours of the North Is. of which the fullest commercial use can be made are Auckland and Wellington. The prin. straits are Cook Strait, Foveaux Strait, Coromandel Channel, and French Pass. Kapiti Is. is in Cook Strait, and Ruapuke Is. in Foveaux Strait, whilst there are sev. ls. and islets off the coasts of the main is.

Mountains.—The mountainous character of N. Z. is one of its most striking physical features. In the North Is. mts. occupy about one-tenth of the surface, but with the exception of the four volcanic peaks of Egmont (8260 ft.), Ruapehu (9175 ft.), Ngauruhoe (7515 ft.), and Tongariro (6458 ft.), they do not exceed 6000 ft. in altitude. Of those four the first-named is regarded as extinct, and other volcanoes include Mt. Tarawera and White Is., both of which have in recent times erupted, with disastrous consequences. Closely connected with the volcanic system are the multitudinous hot springs and geysers. The South Is. contains much more mountainous country than is to be found in the N. Along almost the entire length runs the great chain known as the S. Alps, rising to its culmination in Mt. Cook (12,340 ft.), and no fewer than seventeen peaks of this range are over 10,000 ft. high. Owing

to the snowline being low in N. Z., many large and beautiful glaciers exist, the Tasman Glacier (S. Alps), over 18 m. long and 14 m. wide, being the largest. In the North Is. the two prin. ranges are the Ruahine Range and the Tararua Mts. To the W. and N. of the Ruahine Range are the Kaimanawa and other ranges. The volcanoes of Tongariro and Ruapohu are to the S. of Lake Taupo; the most noteworthy peak in North Is., Mt. Egmont, stands in the centre of a promontory on the S.W. coast and is conical in shape. The S. Alps are crossed at intervals by low passes, and their

(9510), Bristol Top (9508), Walter (9507), Grey (9490), Green (9307), Hutton (9297), D'Archiac (9279), Bell (9276), Hochstetter Dome (9258), Earnshaw (9250), Nathan (9200), Barncoat (9183), Sibbald (9181), Arrowsmith (9171), Spencer (9167), The Footstool (9073), Itudolf (9039), and The Dwarf (9025). There are also at least ninety other named peaks all over 8000 ft., and fifty over 7500 ft. Although N. Z. is mountainous it has extensive plains, lying mostly on the W. side of North Is. and on the E. side of South Is. The general character of the N. Z. scenery is similar to that of the Brit.



New Zealand Government

PEMBROKE ROAD, WAKATIPI, SOUTH ISLAND

highest summits are covered with perpetual snow, and have immense glaciers in their higher valleys. Between Mt. Franklin and the W. coast are the Paroa Mts., and between these and the E. coast are the Kaikoura Mts. (highest peaks, Tapuauenuku, 9465 ft., and Alarm, 9400 ft., with nine others over 7700 ft.). The chief peaks of the S. Alps besides Mt. Cook are: Tasman (11,475), Dampier (11,287), Silberhorn (10,757), Lendenfeldt (10,450), David's Dome (10,443), Malta Brun (10,421), Torres (10,376), Teichelmann (10,370), Sefton (10,354), Haast (10,294), Elie de Beaumont (10,200), Douglas Peak (10,107), La Pérouse (10,101), Haizinger (10,059), De la Beche (10,058), The Minarets (10,058), Aspiring (9975), Hamilton (9915), Glacier Peak (9865), Aiguilles Rouges (9731), Nazomi (9716), Darwin (9715), Chudleigh (9686), Annan (9667), Lowe (9653), Haeckel (9649), Le Receveur (9562), Goldsmith (9532), Big Mao (9511), Conway Peak

Isles, although the latter have nothing like its mts. or its lakes, hot springs, geysers, etc.

Rivers.—N. Z. abounds in rvs., most of which are, however, shallow and rapid, and none are navigable for more than a short portion of their length. Owing to the steep grades of their channels, few of the rvs. are suitable for navigation, except near their mouths, but to compensate for this drawback, they furnish ideal sites for power plants; and no country S. of the equator, except Chile and Patagonia, possesses greater stores of energy conveniently placed. The only part of the dominion which has rvs. capable of being used for navigation is the North Is. The relief is not so marked as in the S., and many streams flow in deep beds, with a somewhat sluggish current. The rvs. flowing into the Tasman Sea are the Waikato, Waipa, Mokau, and Wanganui, and they are useful for modern transport, especially the Waikato. This riv. rises

In the snows of Ruapehu, and flows in a northerly course for 20 m. as a nit. torrent till it reaches Lake Taupo, on leaving which it plunges over the Huka Falls, formed by a hard ledge of volcanic rock; and then runs first N.E. and then N.W. till it reaches the sea. On the other coast of the North Is., the only streams capable of being used for navigation except just at their mouths are those flowing into the firth of Thames, i.e. the Waikato and the Waihou. The remaining rvs. of the North Is. of any importance rise in the mt. axis stretching from near Wellington to the Bay of Plenty. The central and S. parts of the Tararua and Rimutaka ranges are drained by the Manawatu, Otaki, and other streams running into Cook Strait, by the Hutt R. which flows into Wellington harbour, and by the Ruamahanga and its trib. Several large rvs. rise in the Ruahine Mts. and their northerly extensions. In the S. Alpine system, the streams flowing to the W. coast of South Is. cross the narrow strip of coastal plain and cut their channels through old glacial drifts which at one time furnished rich leads of alluvial gold. Chief rvs. flowing from the central portion of the S. Alps to the Tasman Sea are the Taramakau, Arahura, Hokitika, Wanganui, Wataroa, Waiho, Karangarua, Haast, and Arawata. All these rise in glaciers and their valleys are noted for their magnificently diversified bush and mt. scenery. The general features of the rvs. which flow into the W.-coast sounds are somewhat similar except that few rise in glaciers, and the rvs. on the E. slope of the Alps present features similar to those on the W. coast in their upper courses, but their valleys are broader and flatter. The largest of these rvs. is the Clutha, its volume of discharge being greatest of any riv. in the dominion. Portions of the course of the Clutha are navigable, but only to a very limited extent; but it is important commercially because it has yielded, by means of dredging operations, large quantities of gold. The Jacobs, Oreti, Mataura, and Taieri rvs. belong to the Southland and Otago dist.; forming the N. boundary of the Otago prov. dist. is the Waitaki, which drains a large area of Alpine country, and includes in its basin Lakes Tekapo, Pukaki, and Ohau. Its main affluents are the Tasman and the Godley. The chief rvs. rising in glaciers in the S. Alps are the Rangitata, Ashburton, Rakaia, and Waimakariri, and further N. are the Hurunui and Waiau.

Lakes.—The N. Z. lakes are usually attributable to the filling-up of hollows formed by faulting or warping, or by volcanic explosions, or by the irregular accumulation of material round volcanic vents, or to the interference with river valleys by glaciers; and, since all these agencies have operated on an extensive scale in N. Z. in comparatively recent geological time, it is not surprising that its lake systems are well developed. The striking lakes of the middle of North Is. are due to volcanic action; those in South Is. to glacial action. Hence there are two distinct types of lake scenery. In the

South Is., the lakes lie amidst splendid mt. scenery, their waters 'rendered milky-white at times with the finest of sediment worn from solid rocks by powerful glaciers, and swept down to the quiet waters of the lake by turbulent glacial torrents.' In the North Is., the relief of the land near the volcanic lakes being by no means marked, the shores of the lakes are rarely precipitous, and their scenic interest depends on their surrounding sub-tropical bush and partly on their desolate and forbidding environment. The largest sheet of fresh water in N. Z. is Lake Taupo, in the heart of North Is., at an elevation of 1211 ft. above the sea (area 238 sq. m., greatest length 25 m., greatest breadth 17 m., maximum depth 534 ft.). Near the middle of the lake lies the is. of Motutapu, probably the summit of a volcanic cone. The lake forms an enormous reservoir of power conveniently located for exploitation. An interesting group of lakes lies in the midst of the thermal region to the N.E. of Lake Taupo. These comprise Rotorua, Rotoiti, Rotoehu, and Rotomahana. The largest lake of the S.E. group is Tarawera, N. and W. of Mt. Tarawera; others are Rotokakahi, Okaroku, and Okataina, all owing their interest to the thermal action which occurs near them, and to their fishing, for they are especially well stocked with trout. Some 40 m. from the E. coast, in Hawke's Bay dist., is Lake Waikare Moana (21 sq. m. in area), lying 2015 ft. above sea level, and having a maximum depth of 846 ft. Along the coast-line are many small lakes, such as Rotokawa and Horowhenua; and a large shallow expanse of water occurs near the mouth of the Wairarapa valley, called Lake Wairarapa.

In the South Is., in the Grey R. valley, are two fair-sized lakes, Brunner, 15 sq. m., and Poerua—the former bounded on two sides by high wooded granite peaks. A beautiful sheet of water is Lake Kanteri (8 sq. m.) in the basin of Hokitika R., near Mt. Tuhua. On the E. side of the main divide lie the great valley lakes belonging to the riv. basins. These include Lakes Sumner, Coleridge, Heron, Tekapo, Pukaki, Ohau, Wanaka, Hawea, Wakatipu, Te Anau, Manapouri, Mono-wai, Hauroko, and Potoriteri.

Before the eruption of Mt. Tarawera in 1886, the Rotomahana Lake was widely celebrated for its pink and white terraces and boiling springs, which were then destroyed. The hot springs of the North Is. form one of the most remarkable features of N. Z. They are found over a large area, stretching from Tongariro, S. of Lake Taupo, to Ohauawai (a distance of 300 m.); but the prin. seat of hydro-thermal action appears to be in the vicinity of Lake Rotomahana, 40 m. N.N.E. from Lake Taupo. In spite of the destruction wrought in 1886, however, the natural features of the country, lakes, geysers, and hot springs (which last-named possess remarkable curative properties in certain complaints) are still very attractive to tourists and invalids. The importance of conserving the famous

region as a sanatorium for all time has been recognised by the govt. and it is dedicated by a statute to that purpose.

Geological Formation.—The geological hist. of N. Z. is as complex and as ancient as that of a continent. Lava probably persisted in the N. Z. area from the oldest Palaeozoic age, or even earlier. The two important geological periods for N. Z. are those that followed the two latest int.-building movements, the Kaikoura deformation of the late Tertiary time, and the Hokonui deformation of the early Cretaceous. The deposits of the intervening period of relative crustal stability cover a large part of the land, and contain all the coal and most of the limestone of the country. The soils on which grow the forests, pastures, and crops are of post-Tertiary age, and the great bulk of the gold has been won from deposits formed during the same period.

Seismology.—Earthquakes are, unfortunately, somewhat frequent in N. Z., that of 1931 being especially severe. The earthquakes of the Auckland Peninsula, a seismically sensitive dist., may be locally severe, but are not usually felt far from their point of origin. The tectonic earthquakes along the main earth-fold, however, shake large areas; but, fortunately for N. Z., the most severe earthquakes originate along the great shears that cut the submerged flank of the main fold 200 m. E. of the North Is. Many great faults and fault-zones have been traced by seismologists for long distances, but a few only have been active since European occupation. Recent levellings indicate that the earth-block towards the E. is sinking somewhat irregularly, a movement causing some of the innumerable local aftershocks still being felt in that area. Other sensible earth-movements occurred in connection with the Taupo earthquake of 1922, the Amuri earthquake of 1888, the Wellington earthquake of 1855, and probably the Awatere earthquake of 1848. In 1929, the N.W. part of South Is. was visited by a severe earthquake which was felt over the whole dominion, but only seventeen lives were lost, as against over 200 in the much more severe earthquake which occurred in Feb. 1931 in North Is., with disastrous results to the tns. of Napier and Hastings in the prov. dist. of Hawke's Bay (in Napier about 145 persons lost their lives).

Climate.—The climate of N. Z. is temperate and healthy, and similar to that of Great Britain, save that it is warmer and more equable. More rain falls on the W. than on the E. coast, and the climate is more equable on the former. Naturally, considerable variations are met with in different parts of a country which extends for over 1000 m. from N. to S.; the extreme N. of North Is. is sub-tropical in character, whilst severe frost and deep snow on the uplands are common in winter in the South Is.

Flora and Fauna.—The only pre-European mammals were the Maori rat and dog, but there were also native bats. The native plants are numerous and include many peculiar species. There are

about 120 indigenous forest trees, all of them evergreen; the kauri pine, sev. kinds of cedar, red and white birches, and the iron-wood tree may be mentioned. A great variety of ferns is found, and large tracts are covered with nutritious indigenous grasses which support over 32,000,000 sheep. The N. Z. flax (*Phormium tenax*) is a vegetable produce of considerable importance, being much used in rope-making. With few exceptions, the most beautiful flowers of N. Z. belong to the high-int. flora. There are giant buttercups, white and yellow (but nearly all the flowers are of these colours) and they are to be seen by the acre; there are also lovely ourisias, with the flowers in whorls round the stem, as in some of the Asiatic primulas; forget-me-nots, yellow, bronze, purple or white; the snow-groundsel, with marguerite-like flowers; and edelweiss, far surpassing the Swiss. But the chief plant of the mts. is the *Celmisia*, whose leaves cover sub-alpine slopes with a mantle of white. Birds are numerous, and also include many species peculiar to the country, such as sev. flightless and weak-winged types. These include the kiwi (see *APTERYX*), kakapo or ground parrot (*Strigops*), takape (*Notornis Mantelli*), and the extinct moa and *Aptornis*. There are also the parrots kea and kaka. Fresh-water fish are not numerous, with the exception of eels; but many varieties of edible fish are found on the shores, and excellent oysters. Sharks are common, but rarely attack man, and penguins are found on the islets of the far S. Amongst sea mammals whales are the most important, and at one time extensive whaling was carried on, but the industry has declined greatly since 1840. There are no reptiles beyond various species of lizards and frogs.

With the advent of Europeans the whole face of the fauna of N. Z. was changed. Capt. Cook introduced the first pig in Queen Charlotte Sound in 1773. With settlement, sheep, cattle, and horses, and other domestic animals were brought; also song-birds, and animals, birds, and fish for sport, such as deer, trout, pheasants and quail. But the introduction of rabbits, stoats, and weasels was an irretrievable blunder, owing to the damage wrought by these animals to vegetation and bird life.

Railways.—Construction on the first railway in N. Z. was begun in 1860 and the first part opened in 1863. The line ran from Christchurch to Lyttelton. All railways in N. Z. are now state-owned save some 180 m. and private lines to factories, etc. They are, after various experiments, managed by a general manager responsible to the minister of railways. The use of electric power is extending and there are now thirty-six sub-stations with a total capacity of 30,525 kVA. In 1945 there were 3504 m. of railway, 1684 being on the North Is. and 1820 on the South Is. The railways are constructed by the public works dept. and when completed transferred to the railways dept. In 1948 the total revenue received amounted to £17,070,872, and the expenditure was

\$17,710,897. The prin. lines are from Auckland to Mokau and Rotorua, from Wellington to Napier, New Plymouth, and Manawatu, in the North Is., and from Culverdon to Lyttelton, from Invercargill to Bluff Harbour and Kingston, from Picton to Christchurch, Nelson to Glenhope, and Seddonville to Ross. There are electric tramway systems in Auckland, Napier, New Plymouth, Wanganui, Wellington, Christchurch, Dunedin, and Invercargill.



English Electric Company

HYDRO-ELECTRIC POWER

Piripaua power station of the Waikaremoana scheme, containing two 28,000-h.p. water turbines. The operation of this station is completely automatic.

Shipping.—Regular and frequent steam traffic exists between all the prin. ports of North and South Is., and communication is maintained with Australia, England, and America. The prin. lines are the N. Z. Shipping Company; the Union Steamship Company; the Oceanic Steamship Company; Shaw Savill, and Albion Company. The prin. ports of the country are Auckland and Wellington in the North Is., and Port Lyttelton and Port Chalmers in the South. The tonnage of all shipping arriving at or departing from N. Z. ports is recorded by the customs authorities. Overseas shipping showed a marked decrease after 1941 owing to the war. The yearly average entry for 1935-39 was 635 vessels, a total tonnage of 2,894,688, whereas for 1941-45 it averaged only 473 vessels, a tonnage of 2,059,783. Entrance from Brit. countries fell by 80 per cent, but from foreign countries only by 20 per cent, on account of increased

trade with the U.S.A. under the lend-lease agreement. The figures for entry in 1947 were 392 Brit. (1,643,256 tons) and 74 foreign (414,735 tons); totals, 466 ships of 2,057,991 tons.

Airways.—Complete control of air transport as a national service was estab. by an Act of 1945. All internal airways are operated by the N. Z. Airways Corporation which was set up by the Act.

Fisheries.—With its great length of coastline N. Z. has always been famed for the productivity of its fisheries. Off its more northerly coasts a variety of sub-tropical fish are found and off the S. coasts are found cold-water fish and the fur-bearing seal. The most important edible fish are the snapper, the tarakihia, mainly taken by trawlers in the waters of the Hauraki Gulf, Bay of Plenty, Hawke's Bay, etc., and a variety of flounders, blue cod, and the groper. The fishing industry is controlled by the marine dept. and all engaged therein commercially must hold a licence. The most important fishing ports are Auckland, Wellington, Thames, Timaru, Napier, Port Chalmers, Lyttelton, and Bluff. The industry was disorganised by the Second World War but began to improve in 1945. There are extensive oyster beds in Foveaux Strait and on the E. and W. coasts of Auckland. Crayfish occur in abundance and also N. Z. whitebait. There is a small whaling industry, and seals are taken under strict gov. supervision.

Minerals and Mining.—The gold-mining industry has declined in importance since the early stages, when it contributed so largely to the progress and settlement of N. Z. The chief minerals are gold and silver, platinum, osmiridium, tungsten ore, iron, silica sand, stone, pumice, sulphur, and coal. The value of gold and silver mined in 1945 was £1,353,207 (128,000 oz.) and £36,752 (245,000 oz.), of coal £4,250,361, and of stone £710,448. Other minerals include copper, manganese ore, cinnabar, tin (cassiterite in the form of 'stream-tin' occurs near Port Pegasus), petroleum (drilling has been carried out in recent years in Taranaki, Hawke's Bay, and Canterbury), kauri gum, phosphate rock, greenstone. N. Z. has a great variety of handsome and durable building stones. Valuable non-brickmaking clays are produced.

Agriculture.—N. Z. is primarily an agric. country: the soil is rich, varied, and fertile, the climate mild and equable, and the countryside well watered. While it is mainly a grazing country noted for its dairy cattle and sheep, crops of wheat, oats, and roots are extensively grown. The total area under field crops is about 1,339,500 ac. Two-thirds of the surface of N. Z. is suitable for agriculture and grazing and the total area under cultivation in 1946 was nearly 20,000,000 ac. The chief crops grown are wheat (260,603 ac. in 1942, 123,751 ac. in 1948), oats (282,408 ac. in 1942, 63,159 ac. in 1948), and barley (41,431 ac. in 1942, 63,398 ac. in 1948). In various parts of the North Is. fruit-growing, especially apples, pears, and

peaches, is carried on extensively. Citrus fruits can be produced, and lemons in particular are cultivated on a considerable scale. There is an export trade in apples and pears.

Forestry.—All state forests and related afforestation activities are controlled by the State Forest Service headed by the director of forestry. In March 1946 the area of state forests was 9,189,763 ac., representing 13·8 per cent of the total area. The policy is one of conservation and expansion, particularly with a view to combating soil erosion. Over £565,000 was spent on afforestation in 1940–41. The prin. softwoods include white pine, mt. cedar, kauri (the largest and most celebrated tree of N. Z.), black pine, miro (used in house-building), silver pine, tanekaha, and totara; hardwoods, black, hard, red, and silver beech, black-maire, hinau, kamahi, kokehoe (sometimes called cedar), manuka, or red tea-tree, pukatea, N. and S. rata, rewarewa, and tawa. The prin. timbers milled in N. Z. are rimu and kahikatea.

Commerce.—The chief industries of N. Z. are the meat freezing and preserving industry and the butter, cheese, processed milk, and allied industries. Next to these come the sawmilling, paper and printing, engineering, and textile industries. The prin. exports are wool, butter, cheese, frozen meat, hides, skins, and gold. About 80 per cent of exports go to Brit. countries, and the United Kingdom supplies about 50 per cent of imports. The prin. exports in the calendar year 1947 were, in £N. Z., wool, 31,933,000; butter, 28,836,000; lamb (frozen carcasses), 18,469,000; cheese, 19,621,000; hides and skins, 10,383,000; mutton (frozen), 4,085,000; seeds (grass and clover), 1,063,000; other meats (dehydrated, meat extract, canned, etc.), 1,385,000; beef (frozen), 3,930,000; other frozen meats, 2,869,000; sausage casings, 1,526,000; milk (dried and condensed), 1,651,000; gold, 1,035,000; tallow, 2,337,000; peas, 894,000. The chief imports (1947) were textiles (woollen, cotton, silk, artificial silk, and linen goods); electrical and other machinery; sugar, wheat, tea, fruits (canned, fresh, etc.), etc.; tobacco, bags and sacks, paper, books and stationery, manures, hardware and cutlery, vegetable oils, drugs and chemicals, ironware, floor coverings, and alcohol; very largely from the United Kingdom and Australia. In 1941 the value (in £N. Z.) of the imports was 49,167,010, and in 1947 128,724,841; of exports (1941), 67,179,413; (1947), 127,713,184.

In 1936 the gov. introduced a guaranteed price system for dairy produce, to ensure stability of income for producers, and undertook the marketing of the purchased produce. During the Second World War this system was extended to all farm produce in effect, by the system of bulk purchase agreement entered into with Britain, and except for wool is still (1949) in existence. There has been little expansion in farm production during recent years, though wool output has been

kept at levels higher than those of pre-war years. The shortage of labour in agric. dists. is a prevalent difficulty. The volume of production of secondary industries, that is, those not connected with processing primary products, increased by 47 per cent between 1938–39 and 1946–47, and the numbers employed increased by 30 per cent. In the main, expansion has been in the development in new branches of existing industries such as engineering, textiles, and clothing. N. Z., however, lacks supplies of some vital industrial raw materials, e.g. iron, and there is a shortage of power supply, which latter may be overcome by hydro-electric schemes now being developed.

State participation in economic activities has long been a familiar feature in N. Z., and has increased since the coming to power of a Labour Gov. in 1935. It takes the form of direct state action, as in railways, tourist services, and broadcasting, and also of controls designed to ensure state direction of the country's economy, whilst leaving its administration to private enterprise.

Population.—The pop. of N. Z. is divided into the Maori and European pop., the Maoris (*q.v.*) being the native inhab. The Maoris are the finest in physique and the highest in intelligence of all the Polynesian peoples, being superior in every respect to the aborigines of Australia. Their language is a Polynesian dialect differing but slightly from the Hawaiian and other similar languages. The European pop. has shown an unbroken increase over the past 100 years and the early preponderance of men over women has now been eliminated, the proportions being about equal. Immigration, which supplied the greatest source of pop. increase in the past, has gradually slowed down; in 1931–35 there was a net exodus; but in 1948 arrivals were 33,141, and departures 27,388.

The last census was taken on Sept. 25, 1945, and figures relate to Europeans unless otherwise stated. The pop. of N. Z. according to this census was 1,702,298 inclusive of 98,744 Maoris. Including Is. tors. (Cook Is., Tokelau Is., and W. Samoa), the total pop. in 1945 was 1,790,256. At present the North Is. holds the greater part of the total pop. (65 per cent) and since 1881, when 60 per cent lived in the South Is., the trend has been towards an increase in this is. The pop. in 1948, exclusive of members of the armed forces overseas, was 1,840,182, including 109,811 Maoris. The chief tns. (pops. including Maoris) are Wellington, pop. 186,100; Auckland, 239,800; Christchurch, 164,000; Dunedin, 83,800; Invercargill, 30,000; Palmerston North, 30,100; Hamilton, 29,400; Wanganui, 28,200; New Plymouth, 22,600; Hastings, 22,600; Napier, 22,200; Timaru, 21,100; Gisborne, 18,500; Nelson, 18,200.

The revenue for 1948 was \$117,116,115 (excluding social security taxes), and the expenditure \$115,330,403. Taxation receipts in 1947–48 for all purposes amounted to \$122,275,911 giving an average of £67·92 per head of mean pop. War

expenditure up to March 1948 totalled £672,742,989, including a gift to the United Kingdom of £12,500,000.

Religion and Education.—There is no state Church, and no state aid is given to any form of religion. The main religious denominations in order of strength (1948) are as follows: Church of England, 625,000; Presbyterian, 376,000; Rom. Catholic, 226,000; and Methodist, 136,000. There are small numbers of representatives of other Christian denominations and a few Hindus, Confucians, and Jews. Education is free, secular, and compulsory. The central administration of education is vested in a minister of education, and the local control is in the

ditions of work and basic wages in all sections of industry and agriculture. An eight-hour day is in force and disputes are settled under an Arbitration Act. A Social Security Act, passed in 1938, became operative on April 1, 1939. The prin. objects of this legislation are (i.) to substitute for the system of non-contributory civil pensions, e.g. old age, widows' and other pensions, a system of monetary benefits on a contributory basis; (ii.) the inauguration of a system of medical and hospital benefits, and of other related benefits. Mention may here be made of the work of Sir Frederick Truby King (1858-1938), a N. Z. physician b. at Wellington. He founded, in 1907, the Plunket Society for the health of women and children, and from 1921 to 1927 was director of child welfare in N. Z., achieving most beneficial results in the lowering of the child mortality rate.

Defence.—A council of defence, consisting of five Cabinet ministers, the chiefs of staff of the services, and the secretary of the Treasury, deals with defence policy and organisation; it acts only in an advisory capacity and responsibility for decisions rests with the Cabinet. The minister of defence is the president of each of the three service boards which are concerned with training and administration. The N. Z. Army is a small regular force supplemented by the territorials. The decision to adopt compulsory military service entails a considerable increase in the army forces, both regular and territorial. The navy includes the cruisers *Bellona* and *Black Prince* (lent from the R.N.), six frigates, two corvettes, ten trawlers, a survey vessel, and four coastal craft. The gross intake of men into the armed forces between 1939 and 1945 is estimated at 224,000, of whom 160,000 joined the army, 12,000 the navy, and 52,000 the air force. In addition, 10,000 women served in the forces. Total deaths in the services and mercantile marine were 11,625.

Constitution and Government.—The country was at first a dependency of New S. Wales, but was separated by letters patent in 1842. Its settlement was effected largely by the N. Z. Company, with a royal charter, which was surrendered in 1850. By an imperial statute of 1847 N. Z. was divided into six prov., later nine, Auckland, Taranaki, Wellington, Nelson, Canterbury, Otago, Hawke's Bay, Westland, and Marlborough, each governed by a superintendent and elected prov. council. In 1878 the prov. system of gov. was abolished, the powers previously exercised by superintendents and prov. officers passing to the governor or local boards, and the country was divided into cos. and bors. An Act granting representative institutions to N. Z. was passed by the Imperial Parliament on June 30, 1852. Under that Act the constitution of a General Assembly was provided for, to consist of a Legislative Council and a House of Representatives. The first session of the General Assembly was opened in May 1854, but the members of the executive were not responsible to



High Commissioner for New Zealand
DUNEDIN UNIVERSITY

hands of nine education boards, and of school committees. There are nearly 2000 public primary schools (226,578 scholars on the rolls in 1947). Secondary education is provided at forty-seven secondary schools, 100 dist. high schools, twenty-eight technical high schools, and technical day schools. There are nine secondary schools for Maoris besides many native schools and Maori mission schools. For higher education, there are four endowed colleges affiliated to the univ. of N. Z., and each specialises in one or more directions. At Dunedin, the special subjects are mining, medicine, dentistry, etc.; at Christchurch, engineering, technical science, and forestry; at Wellington, law and science; and at Auckland, commerce, engineering, architecture, and forestry. There are agric. colleges at Canterbury and at Palmerston North (Massey College), and there are seven schools of mines besides the Otago Univ. School of Mines.

Social Conditions.—There is extensive legislation governing hours and con-

Parliament. The first ministers under a system of responsible gov. were appointed in 1856. In 1907, the style and designation of the colony of N. Z. was altered to 'The Dominion of New Zealand.' By letters patent, May 11, 1917, the designation of governor was altered to 'Governor-General.' Payment of members of the legislative council is at the rate of £375 a year; and those of the House of Representatives £750 a year. The thirty-four members of the legislative council are appointed by the governor-general, and hold office for seven years. The members of the House of Representatives are chosen by electors possessing a liberal franchise: registration of electors on the roll is compulsory. Every elector, male or female, is qualified to become a member (women being given the right to be elected to either House in 1919). Every adult Maori in any of the four Maori electoral dists. can vote, provided he or she be not registered on any European roll. The House of Representatives now consists of eighty, including four Maori members, elected by the natives. The control of native affairs, and the entire responsibility of dealing with questions of native gov., were transferred in 1863 from the Brit. to the N. Z. Gov. In 1865 the seal of gov. was removed from Auckland to Wellington on account of the central position of the latter city. Justice is administered by ten supreme court judges besides three judges in special courts. The police force is a national body maintained wholly by the general gov. The death penalty, except for treason, was abolished by the Crime Amendment Act, 1911.

History.—The hist. of the is. of N. Z. can be traced back some centuries through the traditions and genealogies of the Maori tribes whom Cook found in occupation, but Britain's influence on the country's destiny began only with the voyages of the great navigator in quest of the S. Continent (*see under TERRA AUSTRALIS INCognITA*). Tasman sighted the S. Alps in 1642 but he made no landing. Cook's first voyage off the coast was in 1769-70. Within a brief space of his return in 1771 a plan for the colonisation of the country was put before the Brit. public by Benjamin Franklin and the hydrographer Alexander Dalrymple (q.v.), but colonisation began only after the loss of the Amer. States had brought the penal settlement of New S. Wales in contact with N. Z. Maori visitors to New S. Wales prompted the sympathetic interest of the colonial chaplain, Samuel Marsden, whose first missionary party (1807) were massacred by the Maoris, and the second party did not go out until seven years later and then only to rouse the hostility of Hongi, the Bay of Islands chief, who exploited the missionaries in order to acquire arms for his wars against other tribes. Marsden's intervention, supported by the energy of the Rev. Henry Williams, however, thwarted Hongi's efforts to win a dominating position, and with his death (1828) the bane of intertribal wars was ended. But with no source of tribal authority or

guidance, contact with European civilisation threatened the Maoris with political and economic collapse, and in 1830 Marsden suggested to the governor of New S. Wales the desirability of appointing a Brit. representative in N. Z., backed by naval visits in order to control a growing community which was incapable of adjusting itself to change without such control. The immediate result of this suggestion was that the Brit. Gov. sent a resident, James Busby, to the Bay of Islands, to be subordinate to the gov. of New S. Wales, but Busby's attempt in 1835 to form a confederation of the united tribes of N. Z. proved abortive. The one man whose influence in N. Z. was most profound and enduring was the celebrated Edward Gibbon Wakefield, whose efforts,



High Commissioner for New Zealand

THE TREATY HOUSE AT WAITANGI, BAY OF ISLANDS

The treaty of 1840 was signed here.

despite official and missionary antagonism, to inaugurate systematic colonisation marked, in effect, the dawn of a new era in overseas settlement. Enlisting the support of politicians, religious leaders, business men, and others, he eventually succeeded in his purpose of making N. Z. a Brit. colony in the full sense of the term. It is said that the home gov.'s hand was forced by indications of Fr. missionary infiltration and whaling expeditions in the seas off N. Z. factors which had indeed intensified Wakefield's efforts, for without even troubling himself over official sanction, his N. Z. Company sent out its prf. agent, Col. Wm. Wakefield in May 1839 in anticipation of the arrival of settlers. In that year the gov. sent out Capt. Hobson, a naval officer, to negotiate with the Maori chiefs for the recognition of Brit. sovereignty, and the result was the treaty of Waitangi (Feb. 6, 1840), the charter of Maori rights and a treaty which has had the greatest influence in winning that confidence in the Brit. Crown which has so greatly conduced to the harmonious relations subsisting between 'Pakeha' (white man) and Maori to-day, though in

the intervening period there were wars and occasional violations of the treaty.

Hobson was, in effect, the first Brit. governor of N. Z., and under him Brit. law and gov. were estab. in the N., where the Maoris were most numerous and where the headquarters of the N. settlement were moved from the Bay of Islands into Auckland, which in 1841 became the seat of gov. It was, none the less, the organised colonization of the N. Z. Company which ultimately had the most influence on the character and the plan of the new colony. Under the company's regis was founded Wellington, while new colonies were estab., all round the coast by bodies of settlers who gave to them the names of their places of origin, e.g. Dunedin in Otago harbour, founded by the Bay Association of the Free Church of Scotland in 1848 and Christchurch, founded by the Canterbury Association in 1850. The later settlements, profiting by their predecessors' errors, devoted themselves to pastoral activities from the outset and thereby founded N. Z.'s first staple industry. Land settlement, generally, did not expand as the company had hoped, and for many years settlers preferred to work in the tus. for wages. A still greater error of the company was to ignore the validity or otherwise of the title to land sold to them over the heads of their Maori occupiers. Over this and other matters, such as the imposition of customs duties, discontent flared up into actual warfare in the N. in 1845, but the Brit. Gov. recalled Hobson's vacillating successor, Fitzroy, and sent out the famous Sir George Grey, governor of S. Australia, who soon compelled the Bay of Islands tribes to sue for peace. This was the period of Lord Durham's celebrated report on Canada, recommending the management of internal Canadian affairs by a Cabinet responsible to the Canadian electorate (see DURHAM REPORT), and in relation to N. Z. the Brit. Gov. agreed to the view of the N. Z. Company that N. Z. should have representative institutions. An Act to that effect was passed in 1846, though Grey was opposed to its proposed div. of the country into European and Maori dists., it being evident to him that the Maoris would never agree to a gov. in which they had no share. His arguments prevailed with the gov. and the Act was suspended pending a new Act of 1852. Though Grey had thus delayed self-government in N. Z. for six years it is still open to question whether the colony was really ready for it in 1852. The New Zealand Constitution Act of 1852 was a liberal measure for its time and, subject to subsequent amendments, it is still the basis of the constitution of N. Z. The Act, however, did not go so far as to provide for responsible gov. A motion seeking ministerial responsibility was moved in the local Assembly by Gibbon Wakefield, himself now a colonist, and this being almost unanimously passed, the Brit. Gov. acquiesced at once (1856). Thus in less than two decades of the setting up of Brit. authority in N. Z. (1840) that authority, with but a single

important reservation, had been transferred to the colonists so far as their domestic affairs were concerned.

There were two Maori wars: the first lasted from 1845 until 1848; the second from 1860 with little intermission until 1870. But fully one-half of the tribes have always been friendly to the Eng. and many of them fought on the side of the colonial gov. against their own countrymen. Permanent tranquillity was estab. in 1871 throughout the country. The real cause of the outbreak of 1860 was that the tribes and their chiefs felt that their traditions and whole way of life were jeopardised by the colonists, who had now so firmly estab. themselves that, in the South Is., most of the land had been transferred to the Crown for nominal sums while, even in the N. where Maori settlements were much larger, the Crown owned 4,000,000 ac. Moreover, the Maoris realised that they had no share or voice in the constitution, whence the Maori King movement or attempt to create a Maori state within the state, but mutual suspicion between Maori and European settler was incompatible with any hope of success for this movement. The operations in Taranaki (q.v.) lasted about a year, ending in March 1861. Colonial volunteers and militia, in addition to imperial troops, had taken part in the campaign. At this juncture Sir George Grey returned to N. Z., having volunteered his good offices; but his efforts to win back the confidence of the tribes were in vain and the hopes of peace receded. The tribes of the Waikato, the heart of the Maori King movement, were preparing to renew the fighting. Brit. troops from Taranaki invaded the Waikato in July 1863. Meanwhile there was a protracted dispute with the Brit. Gov. as to whether the wars were justified and whether the use of imperial troops could be defended and as to how far the colonial gov. was empowered to make war on its own responsibility. In the result the colony, recalling Wakefield's advice to do so, relied on its own financial and military resources and the war at length seemed to die away. But in 1868 there was a fresh outbreak in Taranaki under a clever guerrilla leader, Te Kooti. At this moment of danger the home gov. anxious to rid itself of the colony's wars, withdrew the one imperial regiment then in N. Z. (1870), so that this later campaign was fought and won by colonial levies aided by friendly tribesmen. Maori losses were considerably heavier than those of the colonists, which were only a few hundreds, and the Maoris had lost much of their belief in their own destiny as a race. Fortunately, however, there have always been tribesmen, such as Te Wharaoa the 'King-maker,' who have been shrewd enough to grasp European conceptions of statesmanship and thereby foster the hope, gradually realised, that the long struggle would eventually lead the way to partnership. This process was hastened by a Colonial Act providing for the election of four Maori members to the House of Representatives and

by the passing of the Native Schools Act.

Meanwhile gold had been discovered in Otago, in the valleys of the W. coast of South Is. (1861-65) and the inevitable gold rushes spelt much, if irregular, development largely enhanced by the ambitious plans of Julius Vogel, a gold-seeking immigrant who had become colonial treasurer and, in that capacity, introduced his famous public works budget of 1870. Under his schemes 100,000 immigrants were brought into the country; railways were built to open up new lands; new industries including woollen mills, foundries, and paper mills were introduced. There was a severe reaction later from this 'Vogel boom' but under Vogel's successor, Atkinson, financial equilibrium was gradually restored. In the early nineties the public debt of N. Z. was no less than £40,000,000, which in itself affords some indication of confidence in the destiny of the country. For the total amount invested in land and mortgage companies operating in N. Z. was £30,000,000, so that the total Brit. investment in the colony was about £70,000,000. Overmuch reliance on the London money market might, however, have seriously depreciated the country's credit and there was a crisis: in 1894, when the N. Z. Gov. came to the aid of the Bank of N. Z. by guaranteeing an issue of new shares up to £2,000,000. It was significant, however, that the credit of the country was sound enough to save its leading bank from failure. The ensuing years saw considerable legislative activity in the sphere of fiscal and social reform; thus, the Land and Income Tax Act enabled large estates to be compulsorily acquired for settlement, and during 1894-98 were passed a Factory Act, a Shops and Offices Act, an Act for compulsory arbitration in industrial disputes, and an Old Age Pensions Act, all Liberal measures which represented an important change in the progress of N. Z. towards political maturity, besides revealing what later became emphasised as a characteristic N. Z. outlook, an outlook which has in recent years seen striking manifestation in an advanced social security scheme (1938). This Liberal programme was indeed the fruit of the distribution of power between the gov., as representing the people, and the strong capitalist class, resulting in the development of the country's resources to the general advantage, and it owed its success partly to the work of John Ballance and still more to the notable premiership of Seddon (*q.v.*). Seddon was in power to the end of his life and by his state coal mines, state accident and fire insurance, and the like maintained the attitude characteristic of the earlier Liberal reforms; but he was not prepared to accede to more extreme Socialistic demands from the small farmers. The influence of the small farmers increased with each election, and though Seddon's successor, Ward, had no success with them, Massey (*q.v.*), leader of the new Reform Gov., who had been a working

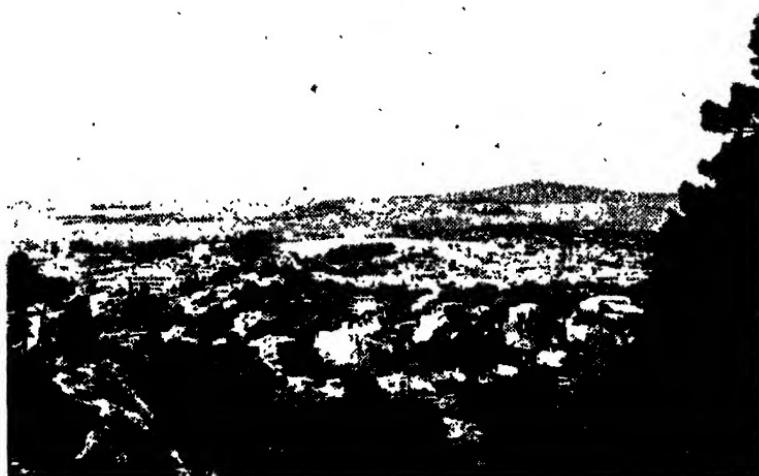
farmer all his life, enjoyed the confidence of the farming community. The development of N. Z. farming had gathered momentum and the N. Z. farmers believed themselves to be the real masters of the country. In view of the great exports of wool and of dairy products there was some justification for their attitude. Feeling themselves the political masters they demanded the right to purchase their freeholds on reasonable terms, and Massey conceded this right.

Always loyal to the imperial connection, N. Z. freely supported Great Britain in the Boer war of 1899-1902. At the outset Seddon, with the practically unanimous support of the representatives, offered a N. Z. contingent and some 7000 officers and men were sent to S. Africa. Throughout his thirteen years of office Seddon, of all dominion statesmen, was the strongest supporter of Joseph Chamberlain's dreams of closer union, and at the Colonial Conference (1902) he suggested that each of the self-governing colonies (as they then were styled) should maintain a body of troops especially for imperial service. At the Imperial Conference of 1911 Ward, who shared Seddon's imperial sentiment, put forward a plan for an imperial council to which the sev. dominions (as they now were styled) should elect members on the basis of their pop. But the proposal came to nothing. Asquith, the Brit. Premier, making it evident that the shaping of foreign policy was the exclusive prov. of the mother country. Ward's purpose, however, was to remedy the position that the dominions could be committed to war by the sole decision of the United Kingdom Gov. However, in 1909, when Brit. naval supremacy was threatened by Germany's programme of construction, N. Z. offered Britain a battleship. In the same year the N. Z. Gov. adopted the principle of compulsory military training. In the First World War conscription was introduced in N. Z. in 1916 and an expeditionary force of 10,000 men sailed for the Middle E. and formed part of the famous Anzac Army. In all 117,000 men volunteered or were called up for foreign service, and 7000 for home service; and of these 92,000 were volunteers. During the later stages of the war there was labour unrest, and the N. Z. Labour party of to-day had its origin in those years. Taxation was greatly increased, but the war was financed by loans. N. Z. began the war with a national debt of £100,000,000; by the end of the financial year 1919 it was £176,000,000, much of the increase being, however, met by borrowing on the local market. The most important effect of the war in N. Z. was a ripening of national self-consciousness, coupled with a fuller appreciation of the difficulties and responsibilities of Britain. Massey, however, did not favour the Canadian and S. African demands for separate representation at the Peace Conference and separate membership of the League of Nations, and indeed he viewed these manifestations of nationalism with apprehension, yet he was not prepared to

give Britain an unqualified support at every turn. Both Massey and Ward took part in the Peace Conference and duly signed the treaties. N. Z. became a member of the League and accepted W. Samoa as mandatory, giving up her previous desire for outright annexation.

After the war the interdependence of Britain's and N. Z.'s economies remained N. Z.'s major preoccupation, for her previous prosperity had declined and the efforts to restore that prosperity form the content of economic and political hist. throughout the next two decades. This was, in part, effected in the early twenties by the passing of export control legislation

better the dairy industry was still at a low ebb and in 1934 a Royal Commission appointed to report on the industry recommended control coupled with more efficiency. N. Z. economic anxieties were further increased in 1935 when the Brit. Gov. decided to tax imported mutton and lamb for the benefit of the home producer. In this crisis the country, under its first Labour Gov., in which Mr. Savage secured fifty-five members in a House of eighty, followed the path of economic nationalism. The Labour Gov.'s first important measure of credit policy was to change the Reserve Bank, estab. in 1934, into a Central Bank to carry out the monetary



*High Commissioner for New Zealand
AUCKLAND FROM MOUNT EDEN*

aimed largely at Brit. shipping companies and middlemen. But although the net result of this legislation was the expansion of the farming industries, the restoration of pre-1914 prosperity seemed as remote as ever. The Coates (*q.v.*) Gov., formed after Massey's death (1925), was not in favour of further borrowing on London, but in 1928 Ward's Gov. was returned to office on a platform of land settlement and railroad development to be financed by loans, and £30,000,000 was borrowed in the next few years. When, however, in the economic crisis of 1930-32, it appeared that the Brit. market for N. Z. farm produce had shrunk, N. Z.'s economy was seriously threatened, though after the Ottawa Economic Conference (*q.v.*) hopes were entertained that the country's dairy produce exports would recover as the result of the institution of preferential tariffs against foreign produce. By the end of 1933 N. Z. was on the road to recovery, mainly through the expansion of the wool market, but in a world in which guns were of greater importance than

policy of the gov. By 1938 N. Z. felt that its prosperity had been restored, for in 1937 her exports yielded nearly £67,000,000, almost as high a total as had ever been achieved. This was accomplished during an era of Socialist administration, when high wages were paid and an ambitious programme of public works set afoot as a system of relief for unemployment, pensions were increased, a big housing programme was begun, and the 44-hr. week had been introduced; all this had been accomplished without having solved the problem of dairy produce exports, though agreement with Britain had been reached on the question of marketing of meat. But this newly won prosperity rested on a insecure foundation inasmuch as the country was importing more than it could pay for. The gov. found that it could only discharge its liabilities for interest on loans by a policy of restricted trade and in the result a new loan was arranged. Brit. Gov. credits of £6,000,000 for defence and an export credit of £4,000,000 to finance

Imports were granted as a result of the mission of Walter Nash, the N. Z. finance minister. Throughout this period of repeated economic and financial difficulty, however, the will to co-operate with Britain politically was never wanting in N. Z. Common interests strengthened the community of sentiment and political tradition. Conscious of her interests in the Pacific, N. Z. actively supported the construction of the Singapore base (q.v.) and Massey protested when construction was suspended by the Brit. Labour Gov. of 1924. The N. Z. Gov. contributed £1,000,000 when work was resumed. With the return to office of a Labour Gov. in N. Z. in 1935 there was, for the first time, a pronounced difference of views on foreign policy between Britain and N. Z. This difference concerned 'collective security,' belief in which N. Z. shared with the Labour Opposition in Britain as the best policy for the empire in general. For the N. Z. Gov. had a strong faith in the League of Nations and had little sympathy with the Brit. Gov.'s efforts to compromise between the moral ideals of appeasement and power politics. None the less, at the Imperial Conference of 1937 N. Z. agreed to co-ordinate her defence policy with that of Britain, and the nearer the clouds of the Second World War approached, the less did the N. Z. Gov. insist on its independent point of view, and the clearer became its sturdy resolve to stand by Britain. The Brit. declaration of war on Germany was regarded as binding on N. Z. and when war came New Zealanders stood loyally where their fathers had stood, side by side with Britain. The risk that Japan might strike together with her Axis partner enhanced N. Z.'s anxieties and it seemed doubtful whether she could afford to dispatch an expeditionary force to Europe; but this risk was lessened by Germany's pact with Russia, and in the result the N. Z. Gov. agreed to send and maintain a force of one div. The achievements of this div., known as 2nd Div., under the command of Sir Bernard Freyberg, V.C. (q.v.) (who became governor-general in 1946), in Greece, Crete, at El Alamein and in the advance to Tunis and in Italy, culminating in the final advance to Trieste, no less than the exploits of N. Z. members of the R.A.F. and of the R.N. and an infantry div. which fought in the Pacific with U.S. forces, have added fresh lustre to the hist. of the country, besides emphasising her position as a loyal member of the Brit. Commonwealth of Nations (see W. P. Morrell, *Britain and New Zealand*, 1944; and the articles AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN; ITALIAN FRONT, SECOND WORLD WAR, CAMPAIGNS ON, and LONG RANGE DESERT GROUP).

It was not until the end of 1947 that at long last N. Z. adopted the prin. sections (2-6) of the Statute of Westminster and passed a further Act asking the United Kingdom Gov. to legislate to relieve N. Z. of restrictions remaining, under an amending Act of 1857, on N. Z.'s powers to amend its own constitution, a

request which was promptly acted upon by the passage of the New Zealand Constitution (Amendment) Act 1949 repealing the New Zealand Constitution (Amendment) Act 1857 and making it lawful for the Parliament of N. Z. 'to alter, suspend, or repeal, at any time, all or any of the provisions of the New Zealand Constitution Act, 1852.'

A national referendum held on August 3 (1949) resulted in an overwhelming majority in favour of the Fraser Gov.'s proposals to institute compulsory military training in N. Z. The returns were: in favour, 533,016; against, 152,443. Sixty per cent of the electorate, including the Maoris, went to the poll. After fourteen years in office the Labour Gov. was defeated by the National party, whose leader, S. G. Holland, became Prime Minister (Dec. 1949).

Literature and Art.—As might be expected, the literary roots of N. Z. are Eng. In the early days of the colony the time and energies of the settlers were almost entirely taken up with the hard task of developing the country and winning a meagre existence from the soil. Contact with the Maori culture provided them with little else but material for the natural historian. The earliest writing to come out of N. Z. consisted of scientific accounts of the natural hist. and natives of N. Z. Among those early writers may be mentioned Edward Jerningham Wakefield, *Adventure in New Zealand* (1845); Ernst Dieffenbach, *Travels in New Zealand* (1813); Sir George Grey, *Mythology and Traditions of the New Zealanders* (1854). Poetry was even less in evidence in these early years, although a certain amount of rough verse in ballad form was written and disseminated in broadsheets by such men as Wm. Golder (c. 1850).

The overriding preoccupation with economics and commerce persisted into the latter half of the nineteenth century, and Samuel Butler, who went to N. Z. in 1860, wrote scathingly of the prevailing concern with sheep. At this time a number of minor novelists appeared who wrote long and serious novels of a high moral tone with involved plots and a strong Puritan bias. Lady Barker wrote *Station Life in New Zealand* (1870) and *Station Amusements in New Zealand* (1873) and other works of a domestic and semi-fictional character; Mrs. C. Evans and Dugald Ferguson were authors of a similar school. At this time also a hist. of the Maori wars was written by J. E. Gorst (later Sir J. E. Gorst, q.r.), entitled *The Maori King* (1864), an important and absorbing account from first-hand observation, and by F. E. Manning's *History of the War in the North* (1862) and *Old New Zealand* (1863). Among poets of the period may be mentioned F. N. Broome, Alfred Donetti (Browning's 'Waring'), and Tom Bracken. Their work, however, was largely derivative Eng. minor verse.

At the turn of the century the level of writing was improving and perhaps the most noted author was Wm. Pember

Reeves, a well-known lawyer, politician, and journalist, author of *State Experiments in Australia and New Zealand* (1902), *The Long White Cloud* (1898), and writer of the national song *New Zealand* (1898). Jessie Mackay the poetess belongs to this period, and Edith Grossman the novelist, a strong supporter of the feminist movement.

At this time the cultured New Zealander was always strongly tempted to leave the somewhat prov. atmosphere at home and to migrate to London. Of such the most famous was Katharine Mansfield (q.v.). Born in Wellington in 1888, she was sent to school in London and returned to Wellington only to leave again for England in 1909. Her stories and sketches have placed her among the foremost contemporary women writers. Another novelist, Win. Satchell, wrote between 1900 and 1914, and H. Guthrie Smith wrote *Tutira*, a noted account of a N. Z. sheep station, in 1921. Guthrie Smith has been called the Gilbert White of N. Z. and his work has something of the imaginative qualities of both the poet and novelist. He gives a detailed account of the natural hist. of the locality and also deals with man's influence on his natural environment, the habits and customs of the Maori, and the acclimatisation of European man and the effects of the various foreign flora and fauna which he introduced.

After the First World War the quality of N. Z. literature improved considerably and writers became emancipated from their Victorian models. From this time onward literary talent appears more frequently, though the domination of London is still apparent. The most promising poet in the 1920s was Eileen Duggan. Among novelists may be particularly mentioned Miss Robin Hyde, authoress of *Passport to Hell* (1932), *Cherk to your King* (1938), and many other novels, who was one of the most outstanding of the contemporary novelists. She has sensitive imagination and a great power of evocation. Other contemporaries are Ngao Marsh, John A. Lee, John Mulgan, and Frank Sargeson. Among poets may be mentioned Walter D'Arcy Cresswell, Evelyn Hayes, James K. Baxter, Ruth Dallas, A. R. D. Fairburn, and Mary Stanley. With the new contacts and widened horizons brought about by the war and modern communications the outlook for modern N. Z. writing is encouraging.

As with literature, so also the origins of N. Z. (European) art date back to about 1800 (for Maori art see under MAORI) and the first efforts are far and few between, owing to the hard life led by the early colonists. Some of the early painters were draughtsmen in the employ of the N. Z. Company and their task was to record various phases of the company's operations and activities. Among these may be mentioned Charles Heaphy, W. Swainson, and J. A. Gilliland, who portrayed N. Z. life and scenery in the 1840s and 1850s. Their style is perhaps conventional and lacking in any great distinction, but faithful to detail. Those of the

generation which followed were rather idealists who were greatly under the influence of contemporary Eng. traditions. John Gully, for example, employed hazy blues and greens more appropriate to the atmosphere of the Brit. Isles. Mention may be made of J. C. Richmond and W. M. Hodgkins, but the most important artist of the period was John Buchanan, a water-colourist, who dispensed with the prevailing naturalism and placed the chief stress on form and contour. By about 1870 a number of art schools had been estab. in N. Z. and art societies founded and galleries opened; the N. Z. Academy of Fine Arts was founded in 1889 and thenceforth art flourished in its own right. At the same time a Dutch professional artist, Van der Velden, settled in N. Z., and it was he who provided a stimulus to N. Z. students. James Nairn emigrated from Scotland and introduced impressionism to N. Z. at this time. By 1900 it had, however, become customary for N. Z. artists to study in London and Paris, with the result that the level of technical competence was raised considerably, though inevitably some talent was permanently lost to the country, e.g. David Low, the famous cartoonist, and Frances Hodgkins. However, with the general improvement in communications after the First World War and the consequent spread of ideas, N. Z. artists responded to outside influences to a much greater extent. The influence of the Fr. post-impressionists has been great and, while it is difficult to single out any name in particular among contemporaries, the following deserve mention: T. A. McCormack, Stewart MacLennan, Russell Clark, A. J. C. Fisher, Cedric Savage, Vida Steinert, and George Woods.

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New Zealand. Bank of, estab. in 1861 by an Act of the N. Z. Parliament, and has now more than 250 branches in Australasia. It acts as banker to the N. Z. Gov., which holds practically all the capital stock.

Next Friend. in law, a phrase used to denote the person who in any transaction acts on behalf of another, where that other, either from youth, mental infirmity, coverture (q.v.), or from some other cause entitling legal incapacity, cannot act for himself (see also CAPACITY; INFANCY; MAJORITY). The N. F. of an infant or minor is not necessarily his parent or legal guardian, for the court will in its discretion allow any one to represent an infant in an action.

Next-of-Kin, see KIN. **NEXT OF,** and **DISTRIBUTION, STATUTES OF.**



MARSHAL NEY

Ney, Michel (1769-1815), marshal of the first Fr. Empire, b. at Saarlonis. He was a non-commissioned officer in a hussar regiment when the revolution began. For the capture of Mannheim he was made a general of div. in 1799. He was interim commander of the army of the Rhine for a short time, during which he frustrated

an important movement of the Archduke Charles against Masséna and the army of Switzerland. After the peace of Lunéville, Bonaparte, anxious to win N. to his party, brought about his marriage with a young friend of Hortense Beauharnais, and appointed him inspector-general of cavalry. On the estab. of the empire he was made a marshal. In 1805 he stormed the entrenchments of Elchingen, and was created duke of Elchingen. He afterwards rendered important services in the Tyrol; contributed much to the Fr. successes of 1806 and 1807; and served in Spain with great ability in 1808 and 1809, but quarrelled violently with Masséna, his superior officer in the invasion of Portugal of 1810-11. In 1812 he received the command of the third *corps d'armée*, and greatly distinguished himself at Smolensk and the Moskwa, in consequence of which he was created prince of the Moskwa. It was due to his devotion in command of the rearguard that some remnants were saved in the 1812 retreat. He had a prin. part in the campaigns of 1813 and 1815. On Napoleon's return from Elba, N. was sent against Napoleon at the head of 4000 men; but N. went over to his side. He commanded at Quatre-Bras, and in the battle of Waterloo commanded the centre, and had five horses shot under him. After the capitulation of Paris he retired to Switzerland; but a costly Egyptian sabre, the gift of Napoleon, led to his being suspected by an official, and arrested. He was condemned to death for high treason, and was shot in the garden of the Luxembourg. His sons pub. his *Mémoires*, 1833. See lives by H. Welschinger, 1893; L. Blytho, 1937, and P. Compton, 1937; also H. Bonnal, *La Vie militaire du maréchal Ney*, 1910-14.

Nez Percés (so called from their custom of wearing nose rings), tribe of N. Amer. Indians, settled in Idaho and E. Washington and Oregon. After the N. P. war in 1877 the survivors were sent to Indian ter., but have now been transferred to Lapwai reservation, Idaho.

Ngami Lake, former lake of W. Rhodesia, Brit. S. Africa. It was discovered by David Livingstone in 1849. It was 70 m. in length, with a breadth of 20 m., but now it is only a swamp.

Nganwheel, or Anhwei, prov. of China, bounded on the E. by the provs. of Kiangsu and Chekiang, on the W. by Hupeh and Honan, and on the S. by Kiangsi. It is watered by Yangtse-kiang, which flows through the fertile tea-growing dists. of the prov. Other products are wheat, cotton, rice, and indigo. The prov. is mountainous in the W., reaching an elevation of over 7000 ft. The north section is drained by the Huai R. Iron and coal are found, but they are not mined to any great extent. Its cap. is Hwaining, and its treaty port is Wuhu, which has railway communication with Wenchow in Chekiang. Area 54,305 sq. m. Pop. 21,705,000.

Ngatoro, see under MAORIS.

Ngolo-Setas, people of N.E. Tibet. The N.-S. ter. includes the drainage area of

the Upper Tong R., and also probably extends to the N. as far as the dists. watered by the great bend of the Hwang-ho. The ter. lies between two mt. systems, the extreme of the E. end of the Bayen-Khara Mts. on the N.W., and the complex formed by the chain which extends from the Tao Fu Mts. to Mynia Gonka, and by the Sseutchaean Alps on the E. and S.E. It is a plateau whose highest level is 16,000 ft. In addition there are wide, deep valleys; the herdsmen of the former and the settlers of the latter communicate by means of the secondary valleys of the trib. streams, each being the economic supplement of the other, trade being controlled by the monasteries. The collection of nomads in N.E. Tibet is a loosely organised confederation of tribes, the Ngolos and Setas being the most important. Their independence of the Chinese authority in Sinkiang prov., and of the temporal power of Lhasa, explains the superficial cohesion of the ensemble, and the slight knowledge which the outside world has of them. It would appear that the Setas are but a tribe of the Ngolos and the relationship of the two is close enough to justify the hyphenated name. The nomads of the plateau, the N.-S. proper, have the social conditions of all pastoral peoples, in which most of the work is done by the women. The duty of the adult males is to protect the camp, which leaves them enough time and energy for raiding. Sometimes expeditions are directed against the valley peoples, but the usual target is the caravans of strangers; the salt caravans from the Koko-nor are seemingly immune. The strong influence of the magical superstition of Lamaism tends to provoke battle and bloodshed on the plateau. The N.-S. warriors have long hair falling to the shoulders, wear ear-rings of silver, and dress in sheepskin with the wool inside. Apart from their different modes of life, it is probable that anthropological research would reveal important morphological differences between the inhab. of the plateaux and those of the valleys. The N.-S. were first mentioned by Père Huc, and descriptions may be found in his *Souvenirs d'un voyage dans le Tartarie, le Thibet, et la Chine pendant les années 1844-46*, 1850. See also A. Guibaut, *Tibetan l'venture*, 1947.

Ngornu, tn. of Bornu, W. Africa, on the S.W. shore of Lake Chad. Pop. 20,000.

Niagara (formerly Newark), tn. and summer resort of Ontario, Canada, in Lincoln co., on Lake Ontario, at the mouth of the N. R., 15 m. from the falls.

Niagara Falls: 1. On lower Niagara R., which is 20 m. in length, and connects Lake Erie with Lake Ontario. The falls are the greatest in the world in volume of water. At Goat Is. the riv. divides. There are two distinct falls, side by side: the Amer. Fall, a sheer descent of 167 ft., and 1060 ft. wide; and the Horse-shoe Fall, on the Canadian side. The volume of water of this fall is terrific, and a depth of 158 ft. is taken in a leap; the spray is like heavy rain. It has been estimated that the water is at least 20 ft.

in thickness. The fall is over a grand curve of rock measuring 3010 ft. The whirlpool is just below the falls, a raging mass of turbulent water. The riv., now a quiet, gently flowing stream, enters the lake of Ontario at Lewiston. The drop between Lakes Erie and Ontario is 328 ft. The edge of the Horse-shoe Fall is receding to the extent of 5 ft. each year. It is believed that the original falls were at Lewiston. The Gov. Reservations, on both sides of the falls, have been turned into fine parks. One of the best points of view of the fine Horse-shoe Falls is from the railway track, and observation cars are run, and the trains are



L.N.A.

NIAGARA FALLS

stopped for some minutes for the benefit of tourists. The falls were discovered in 1678 by a Fr. priest, but his description was laughed at as a traveller's tale. For over half a century the water has been used for industrial purposes, many manufacturing plants being worked by its power. The largest of the plants constructed is the Queenston-Chippawa development on the Niagara R. Construction was begun in 1917 and the first unit was in commercial operation in 1922. The total capacity of the diversions for power purposes is 1,010,000 h.p. (Canadian 450,000 h.p.; Amer. 560,000 h.p.). Many thousands of tourists visit the falls every summer. The sight is even more wonderful in winter, when the gigantic falls are in the grip of frost and snow, and huge icicles hang glistening in the sunshine. Three bridges span the riv. The view from the suspension bridge is magnificent, whilst the fine culvert bridge is a triumph of modern engineering. The Rainbow Bridge (replacing a former

bridge destroyed by ice-jams) was opened to traffic in 1941. This new bridge is 950 ft. long and cost about £1,000,000. It is the longest fixed-end steel arch span in the world, was dedicated by the king and queen in June 1939, and has a 10-ft. footway which gives wonderful views of the cataracts. See H. Hulbert, *The Niagara Falls*, 1908. 2. City of Ontario (formerly Clifton), Canada, in Welland, on the W. bank of the Niagara R., opposite the N. F. It is connected with N. Y., New York, by three bridges. There are sev. factories which utilise the water-power from the falls (the total h.p. from the Niagara R. is 830,000). There is a beautiful park along the riv. bank. Pop. 20,589. 3. City of New York state, U.S.A., in Niagara co., on the E. bank of the Niagara R., at the falls, 18 m. N.N.W. of Buffalo. The bridge which here crosses the riv. is 1210 ft. long, and there are also two railway bridges. The falls supply water-power for the city, which is a shipping centre, with important manufs. N. Y. is the site of the largest electric power plant in the world, and is a summer and winter resort. Pop. 78,000.

Niamoy, cap. of the Niger colony, Fr. W. Africa, on the E. bank of the Niger R. The trans-Saharan motor route ends at N.. which trades in ivory. Pop. 5000.

Niam-Niam, or Azandeh, race of negroid stock who formerly inhabited the region lying between the Congo and the Upper Nile, now known as the Welle and Ubangi dists. in the N. of the Belgian Congo, Equatorial Africa. They are allied to the Nubas, and have a dark reddish skin, oblique eyes, and generally round features. They are fond of music and show an aptitude for wood-carving and the fashioning of pottery. The kingdom of the N.-N., which flourished for over two centuries, was destroyed by an Arab invasion, since when the inhab. were dispersed. See G. Schweinfurth, *Heart of Africa*, 1873; W. Junker, *Travels in Africa*, 1890-92; D. Westermann, *Die Sudinsprachen*, 1911; and J. Czechanowski, *Forschungen im Nil-Kongo-Zwischengebiet* (vol. VI.), 1924.

Nias, Dutch is., off the W. coast of Sumatra, with an area of 2100 sq. m. Its surface is mountainous. Rice, coco-nuts, bananas, pepper, tobacco, and sugar are grown. Pop. about 187,200. See E. W. Schröder, *Nias: Ethnographische, geographische en historische*, 1917.

Nibelungenlied, or *Der Nibelunge Nöt*, old Ger. epic poem embodying stories and traditions which were current in Germany before its writing, and which dates from some time near the beginning of the twelfth century. The N. really derives from the *Völsungsaga*, the Scandinavian prose version of a lost poem or great poetic saga which is believed to have been the earliest coherent form of the story so universal among the Teutonic peoples. Fragments of this great saga are to be found in the poet's *Edda*, dealing with the chain of stories of the two heroic families of the Völsungs and the Niblungs. The romantic epic, *Der Nibelunge Nöt*, is a further extension and corruption of the

Scandinavian myth; but neither in this nor in any modernised or Teutonised form does the auct. legend touch such a consummate height of heroic poetry as in these earliest fragments of Icelandic song. The author of the N. is not known, but he drew his materials not only from various well-known lays and poems, but probably from a more or less connected account of the twelfth century, and, according to some authorities, from Lat. poems also. The story relates how Siegfried, son of the king of the Netherlands, and the possessor of the treasure of the Nibelungs, wins as his wife Kriemhild, the sister of Gunther, king of the Burgundians. For the latter he obtains the hand of Brunhild, queen of Iceland, by causing him to be successful in three trials of strength. This he accomplishes by wearing a magic cloak, and thus being invisible beside Gunther. Some years after, Brunhild, Gunther's wife, brings about the murder of Siegfried by means of Hagen, who by treachery finds out the hero's vulnerable spot and slays him. He afterwards secures the treasure which has become the property of Kriemhild, and buries it in the Rhine. The widow finally accepts the hand of Attila (Etzel), king of the Huns. She then induces Gunther and Hagen to visit her court, and they with members of their train are slain at the instigation of Kriemhild, who had always vowed vengeance on Hagen. She herself, however, is also slain at the end of the conflict, which is a scene of awful slaughter. The *Klage*, a poem written about the same time as the N., deals with the lament of those who survived the destruction. The chief eds. of the N. are those of K. K. F. W. Lachmann, 1826, and K. Bartsch, 1870, the latter ed. by H. de Boor (1940); there are Eng. trans. by A. G. Foster-Barham, 1887, and Margaret Armour, 1897; see also Margaret Armour (trans.), *Gudrun*, 1928 (Everyman's Library); D. von Kralik: *Von deutschen Art in Sprache und Dichtung* (vol. ii.), 1941; and N. Dürrenmatt, *Das Nibelungenlied im Kreis der höchlichen Dichtung*, 1945.

Nicæa (modern Isnik), city of anc. Bithynia, in Asia Minor, on the E. shore of Lake Ascania. It was built by Antigonus, the son of Philip, in 316 B.C., and named Antigonea, but the name was changed by Lysimachus to N. in honour of his wife. N. was of great importance under the Rom. and Byzantine emperors, having fine streets and monuments. The sultan Soliman had his cap. here in 1078, and after the Lat. conquered Constantinople in 1204, N. was the cap. of an E. empire. It was besieged and taken by the crusaders during the First Crusade (1096).

In eccles. hist. it is noted as the scene of two councils; the First Ecumenical Council, consisting of 300 bishops and the Emperor Constantine, was held here in A.D. 325 to discuss, among other things, the Arian question and the Meletian schism, and to fix the date of Easter; the Nicene Creed (q.v.) had its first formulation. The Seventh Ecumenical Council, held here in 787, discussed mainly the

question of image worship. See also NICÉ (for which a former name was N.).

Nicander, Karl August (1799-1839), Swedish poet, b. at Strengnäs, was educated at the univ. of Upsala. In 1820 he pub. his first vol. of poems, and by his powerful tragedy *Runesvarde* (The Runic Sword) he won a foremost place among his literary contemporaries. He also wrote *Rumor* (The Rumors), *Euzio*, 1825, and *The Death of Tasso*, for which he was awarded a medal by the Swedish Academy. After a tour in Italy in 1827 he pub. *Memories of the South*.

Nicaragua, republic of Central America, between the Caribbean Sea and the Pacific Ocean. Area 57,145 sq. m.; pop. 1,148,700. Along the Caribbean coast there are lagoons, estuaries, and swamp lands, but the Pacific coast is rocky. The prin. ports are Corinto, Brito, and San Juan del Sur on the Pacific side, and Bluefields and Greytown (San Juan del Norte) on the Caribbean. The Cordillera de los Andes, a volcanic range, crosses the northern half, Cosequina (3835 ft.) and El Viejo (6267 ft.) being the highest summits. The cap. of the republic is Managua, with a pop. of about 141,900. Among other ins. Matagalpa has a pop. of 52,000; León, 51,700; Jinotega, 39,900; Granada, 38,900; Masaya, 37,600; Chinandega, 25,500; and Bluefields, 20,300. Two large lakes, the Managua and the N., are situated in Central N. The latter is 100 m. long and has an area of 2900 sq. m. There are five rapids on the San Juan R., which greatly impede navigation. The climate is tropical except on the highlands. Coffee, bananas, rubber, and hides are the chief products; coffee formed 25 per cent of the 1947 exports. Sugar, timber, maize, rice, and cocoa are also produced. There are rich undeveloped resources. Gold is mined on the Caribbean coast. The forests yield mahogany and cedar, and form a valuable part of the exports. There are also other excellent timber trees, rosewoods, guiacum (or lignum vitae), gums, and dyewoods. Rubber is also produced. In 1947 the imports were valued at \$1,085,850 Amer. dollars, and exports at \$20,979,627. Exports to the United Kingdom totalled £45,124 and imports from the United Kingdom, £13,440. There are 411 km. of railway.

The roads for the most part are mere tracks, and the want of an adequate network has hindered the exploitation of large areas of agric. and forest land. The one important all-weather road is the Inter-Amér. (or Pan-Amér.) highway, which runs for 240 m. from the Costa Rican frontier, through Managua, and north to the Honduran frontier. A concrete highway, 19 m. long, from Las Conchitas, is open to Massahapa, on the Pacific. A branch road of the Inter-Amér. highway is being built from San Benito on the highway, to Rama, 60 m. from Bluefields, on the Atlantic. There are air services to the U.S.A. and the Central and S. Amer. republics. There is a powerful wireless station at Managua, with branches at Bluefields and Cabo Gracias a Dios. Most of the people are mixed Indian and

European blood. Primary education is free and compulsory, but the masses are ignorant; illiteracy amounts to about 60 per cent. There are 984 state elementary schools and some secondary, but the latter are carried on by private individuals. There are univs. at Managua, León, and Granada. Rubén Darío (*q.v.*), the greatest of all Sp. Amer. poets, was a native of N. The prevailing religion is Rom. Catholic, and N. constitutes one archbishopric and eccles. prov., the seat of the archbishop being Managua, with bishoprics at León, Bluefields, Granada, and Matagalpa. The gov. consists of a president elected for six years, and a Congress composed of two houses, the Chamber of Deputies having forty-four members, and the Senate fifteen, all elected for six years by popular vote. The judicial power is vested in the supreme court at Managua, five chambers of second instance (León, Granada, Bluefields, Mesaya, and Matagalpa), and about 150 judges of inferior tribunals. Until recently the gov. of the country was largely controlled by the U.S.A. The National Guard was trained by U.S. marine officers, who with a strong force of marines occupied the country in 1928 to keep order. Banditry has by no means disappeared, and traitors, notably in the Matagalpa area, are protected by bodies of the Guardia Nacional, who in this part replaced the U.S. marines. The U.S.A. acquired naval bases, and the option for a canal route, survey for which began in 1939. There are also plans to canalise the R. San Juan, and thus provide a Caribbean-Pacific link for N. and Costa Rica. See J. Gómez, *History of Nicaragua*, 1889; S. J. Bernardo Portas, *Compendio de la historia de Nicaragua*, 1918; C. R. Enoch, *The Republics of South and Central America*, 1922; H. L. Stimson, *American Policy in Nicaragua*, 1927; T. Gann, *Discoveries and Adventures in Central America*, 1928; and R. de Nogales, *The Looting of Nicaragua*, 1932.

Nicaragua Canal. In 1884 a treaty was made between the gov. of U.S.A. and Nicaragua with the object of cutting a ship canal to link up the Atlantic and Pacific oceans. The canal was begun at Greytown in 1889, and its total length would have been about 170 m., including Lake Nicaragua and the San Juan R. Less than 30 m. would have had to be excavated. Operations were, however, suspended in 1893, and attention was directed to the Panama Canal, whose last barrier was blown away by dynamite in Oct. 1913, and the waters of the Pacific mingled with those of the Atlantic. The N. C., though it would have been a longer route, presented fewer difficulties in the way of natural barriers and fewer gigantic rocks to engineer and blast. The scheme was abandoned owing principally to the political unrest of the country. By a treaty in 1916 the U.S. Gov. for 3,000,000 dollars acquired the option for a canal route through Nicaragua and also for naval bases in the bay of Fonseca on the Pacific coast, and Corn Is. on the Atlantic coast. The treaty was ratified by

Nicaragua in 1916 and by the U.S.A. in 1926. In 1931 Amer. military engineers reported to Congress that a Nicaraguan canal would cost fivefold that of a third set of locks on the Panama Canal, but a later estimate was much lower. Surveys of the route began in 1939.

Nicastro, com. of Italy in the prov. of Catanzaro, 16 m. W.N.W. therefrom. It is a bishop's see. There is a ruined castle in which Frederick II. was confined. Pop. 30,900.

Nicola Pisano, *see PISANO*.

Niccolini, Giovanni Battista (1782-1861), It. poet and dramatist, b. at Bagni di San Giuliano, Tuscany. N.'s first poem, *Peste de Livorno*, appeared in 1804. From 1807 to 1808 he was secretary and prof. of hist. and mythology at the Florentine Academy of Fine Arts. His first dramatic work was the tragedy of *Poltresca* (1810), followed by *Inde Temisto* (1825), *Edipo*, and *Medea* (1825). The first of his political dramas, *L'abucco*, appeared in 1815; another invective against absolute power is *Antonio Foscari* (1827), the most popular of all his dramas, although *Arnoldo da Brescia* is his literary masterpiece (1843) (Eng. trans. by T. Garrow, 1846). His pub. and unpublished works were ed. by Gargioli, 1863-80. See monographs by Barelli, 1888; Ostermann, 1900; Leoni, 1901; and R. Guastalla, 1917.

Niccolò Alunno (c. 1430-1502), *see ALUNNO, NICCOLÒ*.

Nice (ancet. *Nicæa*; It. *Nizza*), seaport and episcopal see of France, cap. of the dept. of Alpes-Maritimes, 8 m. S.W. of Monaco, at the mouth of the Paglione. The city is sheltered on the N., but is exposed to the *Libeccio*, a moist S.W. wind, and is occasionally visited by the mistral, the sirocco, and the tramontane. It has, nevertheless, a delightful climate, supposed to be particularly beneficial to gout and chest complaints. The tourist traffic is the basis of the city's economy. In the centre of the tu. is a high hill (318 ft.), on which the castle, destroyed by the duke of Berwick (1706), formerly stood. The fashionable and residential quarters lie to the W. Along the shore and round the base of the hill stretch fine promenades. The chief public buildings are the Rom. Catholic church of Notre-Dame du Vœu (1935), the municipal casino, art gallery, and observatory. To the E. of the hill are the harbour and port. There is a large coasting trade, and the chief exports are flowers, olives, oranges, lemons, perfume, wines, liqueurs, chocolate, soap, and tobacco. The inhab. execute fine inlay work in olive wood, and also manuf., art pottery.

The ancet. tn. of Nicea was founded by the Phocaeans from Massalia (Marseilles) and so called in commemoration of a victory (Ick. 140^{BC}) over the Ligurians. In the second century B.C. it fell into the hands of the Romans. In the ninth and tenth centuries A.D. it was more than once sacked by Saracen invaders, and was plundered by the Turks (1543). From 1388 until 1706 (save between 1600 and 1691) it belonged to Savoy, from 1706 to

1713 to France, then it was in the possession of Savoy until 1744, reverting to France and Spain in that year. From 1792 to 1814 it was in the co. of Nice, France; it then belonged to Sardinia until 1860, in which year France finally resumed authority over it. It is the hp. of Garibaldi, Masséna, and Vanloo, the painter. Pop. 211,100. See Nash, *Guide to Nice*, 1844; G. Home, *Along the Rivieras of France and Italy*, 1908; E. Berl, *Le Port franc de Nice*, 1924; and M. Malinguie, *Les Primitifs nicois*, 1941.

Nicene Creed, the only creed of the Church which has received ecumenical sanction, was originally drawn up at the Council of Nicaea in A.D. 325 (see ARTUS). It was in the form familiar to Westerns in the Rom. Mass and the Anglican Communion service, but terminated at the words 'And I believe in the Holy Ghost.' It was reaffirmed at the Council of Constantinople (381), and the rest of the creed, as we have it, was then added, with the exception of the word 'Alioque (and the Son)'. See also CREED. See A. d'Ates, *Le Dogme de Nicéen*, 1928; J. S. MacArthur, *Chalcidion*, 1931; and F. J. Badcock, *History of the Creeds*, 1938.

Nicephorus (c. 758-829), patriarch of Constantinople (806), defended the worship of images against the Iconoclasts, and was consequently banished to a convent in Asia by Leo the Armenian (A.D. 816). He wrote *Chronographia Brevia* and *Breviarium Historicum*, also several other historical works. He is numbered among the saints of both the Gk. and the Rom. Church.

Nicephorus, names of three emperors of the E.:

Nicephorus I., was emperor from 802 to 811. He made a treaty with Charlemagne, but in a war with the Saracens and Bulgarians was surprised and slain.

Nicephorus II., was emperor from 963 to 969. In a series of campaigns against the Saracens (960-963) he captured Candia and Aleppo. He was assassinated by his wife and nephew.

Nicephorus III. (Botaniates), last of the Armenian dynasty, was emperor from 1078 to 1081. With the help of Alexius Comnenus, he defeated his rival, Bryennius, but revolt broke out and he abdicated, retiring into a convent.

Nichol, John (1833-94), Brit. author, b. at Montrose. He became prof. of Eng. literature at Glasgow. He wrote a historical review of Amer. literature for the *Encyclopaedia Britannica* (1882). Among his other works are the drama *Hannibal* (1873); *The Death of Themistocles and other Poems* (1881); *Byron* (1881) and *Carlyle* (1892) in the English Men of Letters series; and *Burns* (1882).

Nicholas, Saint (d. c. 360), patron saint of Russia and a native of Patara in Lycia. He is specially honoured as the guardian and patron of children and of scholars, as also of travellers by sea and land, and merchants. He is a prominent saint of the Gk. Church, and there are many legends illustrating his benevolence and good nature. His festival still survives in the Santa Claus of Christmas rejoicings.

See E. Crozier, *The Life and Legends of St. Nicolas*, 1949.

Nicholas, name of five popes and one anti-pope.

Nicholas I., sometimes called the Great, succeeded Benedict III. in 858. His pontificate was marked by three great contests: those in connection with the degraded patriarch, Ignatius of Constantinople, the divorce of Lothair, king of Lorraine, and with the right of bishops to appeal to Rome against the verdict of their metropolitan. He d. in 867. See E. Amann, *L'Epoque carolingien*, 1937.

Nicholas II. (Gerard, a Burgundian) was pope from 1058 to 1061; he owed his importance to the counsel and influence of Hildebrand whose policy of reform he pursued. See A. Fléchier, *La Réforme gregorienne*, 1924-37.

Nicholas III. (Giovanni Gaetano), b. at Soriano, was pope from 1277 to 1280; he strengthened the papal power in Italy and made the Vatican the official residence.

Nicholas IV. (Girolamo Masci), b. at Ascoli, was pope from 1288 to 1292; a member of the Franciscan order, his main object was the recovery of the Holy Land by crusades. The college of cardinals acquired independence by his financial reforms. See O. Schirr, *Studien zur Geschichte Nikolaus IV.*, 1897.

Nicholas V. (Tommaso Parentucelli), b. at Sarzana, was pope from 1447 to 1455. During his pontificate, in 1449, the resignation of the antipope, Felix V., put an end to the papal schism. The fall of Constantinople in 1453 was a great blow to him. He inspired many architectural projects in Rome, and founded the Vatican library.

Nicholas VI. (Pietro Rainaldo) was antipope in Italy from 1328 to 1330 during the pontificate of John XXII. at Avignon. He resigned in 1330, having been excommunicated by John in 1329, received pardon for his sins, and was kept in honourable imprisonment in the papal palace until his death in 1333.

Nicholas I. (1796-1855), Russian emperor from 1825 till 1855, the third son of Paul I., was b. at Tsarskoe Selo. He visited England and Europe in 1816, and in the following year married the eldest daughter of Frederick William III. of Prussia. On the death of Alexander I. he succeeded to the throne, as Constantine, the real heir, had abdicated in his favour. During the early part of his reign some reforms were carried out, but N. soon reverted to the autocracy of the old tsars, supported by the force of arms. The wars with Persia and Turkey ended in victory for Russia (1828), and the crushing of the Poles was accomplished, but were accompanied by a terrible loss of men, as was the Crimean war later. See life by N. de Grunwald, 1946.

Nicholas II. (1868-1918), last Russian emperor; b. in St. Petersburg; eldest son of Alexander III. (whom he succeeded in 1894), and nephew of King Edward VII. of Great Britain. In 1896 he visited France and followed up the understanding between that country and Russia by

signing definite military agreements with President Faure. In 1899, inspired by traditions of the Holy Alliance, he brought about the convention at The Hague of the first International Peace Congress. In reply to the deputation of 1903 on his accession, he repudiated the claims of the people to share in matters of internal administration. In 1902 N. issued a manifesto proclaiming the inviolability of property and the land tenure system as against the growing claims of social democracy, especially in the direction of extending the principle of 'zemstvos' or local elective assemblies to the provinces. A policy of E. expansion led to the Jap. war of 1904-5. Liberal inclinations were shown, however, in his estab. of the Duma the same year. But he came more and more under the reactionary influence of the empress, who was under Rasputin's domination, and this, combined with the



NICHOLAS II.

terrible mismanagement of Russia's part in the First World War, annihilated all respect for his crown. In March 1917, at headquarters, he abdicated, as required by the provisional gov., nominating the Grand Duke Michael to succeed him, but this Michael refused to do. N. was confined at Tsarskoe Selo, Tobolsk, and Ekaterinburg (Sverdlovsk) in the Urals. Yourkovsky, commissary of the last-named place, presumably acting on instructions, shot him dead in a cellar there and his wife and family perished with him, on July 16. See the Eng. trans. of the correspondence with his wife, 1929; Sir J. H. Williams, *The Emperor Nicholas II*, 1922; and life by C. Radzwill, 1931.

Nicholas I. of Montenegro (1811-1921), king of Montenegro, b. at Njegos. He was proclaimed prince in 1860, and in 1900 took the title of royal highness. Ten years later he styled himself king, in accordance with a petition from the Skupština. The Balkan League of 1912 brought the union of Montenegro, Serbia, and Bulgaria with Greece, but the 'Germanisation' of Bulgaria brought the league to naught in the First World War, with the result that the entry of Turkey involved Montenegro, and King N. soon afterwards placed one div. of 2500 men in

the field. By Jan. 20, 1916, however, he had capitulated, proclaiming that unconditional surrender was necessary to avert the ruin of his country. The Montenegrin Grand Assembly in April 1919 affirmed his dethronement and that of his dynasty, and proclaimed the union of Montenegro with the kingdom of the Serbs, Croats, and Slovenes. He wrote sev. dramas (*Balkanska Tzaritza* and *Kniaz Araniti*), a book of poems (*Hajdana Potini Abenseraje*), and one of ballads (*Skupštine Pesme* and *Nova Kola*). **Nicholas** (1856-1929), Russian grand duke and soldier, see under RUSSIA, History.

Nicholas of Damascus (fl. 16-8 B.C.), see DAMASCENUS, NICOLAUS.

Nicholas of Hereford (fl. 1390), Lollard preacher and author, was b. probably in Hereford. A close friend and supporter of Wycliffe, he was condemned and excommunicated by the church council in 1382 for his support of the Lollard doctrines. An appeal to the pope against his sentence led to his imprisonment in Rome. He escaped, but was captured in England. In 1391 he recanted, and after holding sev. offices under the crown retired to a monastery. He aided Wycliffe in his translation of the Bible.

Nichols, John (1745-1826), Eng. historian and biographer, b. at Islington. When thirteen he was placed with Wm. Bowyer, the printer, to whose business he succeeded in 1777. He pub. in 1778 *Anecdotes, Biographical and Literary of William Bowyer, Printer* (enlarged, 1782); and many other works of which he was either editor or author including *The Progresses and Public Processions of Queen Elizabeth* (1788); and *Illustrations of the Manners and Expenses of Ancient Times in England* (1797). The *Gentleman's Magazine* passed into his hands in 1778, and continued until his death. He was succeeded by his son, *John Bowyer Nichols* (1779-1863), who also pub. sev. hist., and was a fellow of the Society of Antiquaries, and of the Linnean Society. See J. Nichols, *Brief Memoirs of John Nichols*, 1804.

Nichols, Robert Malise Bowyer (1893-1944), Eng. poet and writer, educated at Winchester, and Trinity College, Oxford; at the beginning of the First World War he obtained a commission in the Royal Field Artillery, and while serving in France pub. *Invection*, a book of war poems. In 1917 his second book, *Ardours and Endurances*, was very successful. *Aurelia* (1920) contains the finest of his poems; later, however, he snatched at greatness, though only narrowly missing it. His later works, such as the drama *Gulty Souls* (written while he held the Lafcadio Hearn chair of Eng. literature in the Imperial Univ. of Tokyo), tend to be over-long and grandiose. His only publicly performed drama, *Wings over Europe* (in co-operation with Maurice Browne), produced in London and New York, forecast the problems of the Atomic Age. In 1934, *Fisbo*, a long satire, was the last of his poetry, save for a few pieces in 1942, in *Such was my Singing*.

Nicholson, John (1821-57), Brit. general,

b. in Ireland. In 1841 he assisted in the defence of Ghazni, and greatly distinguished himself, but was ultimately captured and imprisoned at Kabul. He was rescued by Gen. Pollock after some months' incarceration. He saw active service during the second Sikh war. After the annexation of the Punjab he served in the Punjab Commission. At the outbreak of the mutiny N. was brigadier-general. His services during that troublous period were invaluable. On Sept. 14, 1857, he commanded the main storming party in the assault on Delhi, but was mortally wounded. See life by J. L. Trotter, 1904.

Nicholson, William (1753-1815), Eng. scientist, **b.** in London. He turned to scientific research after a commercial career with the E. India Company, and made the historic discovery that water could be decomposed by passing an electric current through it. This is an example of electrolysis which is the foundation of many important industrial and scientific operations. Working in company with another Eng. chemist, Carlisle, in 1800, N. constructed an electric battery (known at that time as a 'voltal pile'), from thirty-six half-crowns, and a number of zinc disks and pieces of pasteboard. Though the current produced by this crude apparatus was so minute that only a few thimblefuls of gas were collected over a period of 13 hrs., N. showed not only that water could be electrolysed, but that the two gases of which it is composed appear at different places, the oxygen being evolved where the electric current enters the water and hydrogen where it leaves. N. made many other scientific discoveries after his return from India in 1786. He invented a hydrometer, took out patents for textile printing machinery, planned and carried out a scheme for the water supply to Portsmouth. He was a scientific writer of great contemporary eminence and founded and, until his death, ed. the *Journal of Natural Philosophy*. But the electrolysis of water, a fundamental discovery of very great importance, remains this Englishman's real contribution to the world's total of scientific knowledge.

Nicholson, William (c. 1782-1849), the 'bard of Galloway,' was **b.** in Kirkcudbrightshire. He became a pedlar and wrote verses on his wanderings. The preface to his *Tales in Verse and Miscellaneous Poems, descriptive of Rural Life and Manners* (1814), acknowledges his indebtedness to Hogg. His best poem is the *Brownie of Blednoch*, a folk-lore ballad.

Nicholson, Sir William Newzam Prior (1872-1949), Brit. painter and designer, **b.** at Newark-on-Trent, was educated at the Magnus School there, and trained under Wm. Cubley of Newark, a pupil of Sir Wm. Bechyn, R.A. and in Paris. He collaborated with his brother-in-law, James Pryde (q.v.) in producing the 'Beggarstaff' posters, which owed their inspiration to Whistler and Toulouse-Lautrec and were noted for their theatrical character. N. next produced woodcuts

in colour, which were pub. in collections under the titles *London Types, Characters of Romance, Twelve Portraits*, etc. Unlike many western woodcutters, N.'s work is completely free from the influence of Jap. colour-prints. His first appearance as a painter in oil was in exhibitions of the International Society (of which Whistler was president). He never exhibited in the Royal Academy, but one-man shows of his work were held at the Leicester and the Beaux Arts Galleries, London. In 1933 an exhibition of his work was held in Nottingham in recognition of his birth in that co. The Tate Gallery has two of his best portraits: 'Portrait of W. E. Henley,' bequeathed by Mrs. W. E. Henley (1925), and 'Portrait of Miss Jekyll,' presented by Lutyens (1922); also 'Lady in Furs' and a still-life study 'The Lowestoft Bowl.' He is well represented in Brit. city municipal galleries, e.g. 'The Landlord' in the Manchester City Art Gallery, and other works in the galleries of Liverpool and Nottingham. In the Fitzwilliam Museum are his portraits of Gen. Staats and of A. C. Benson, and also 'The Girl with the Tattered Glove,' 'Armistice Night,' and 'The Gate of Honour under Snow.' He also designed costumes and settings for the stage: e. g. the costumes in *Peter Pan* and the settings and costumes for Massine's ballet *The Rake*. See life by Marguerite Stein, 1943.

Nicias. Gk. painter, son of Nicomedes, **b.** at Athens, and flourished probably between 350 and 300 B.C. According to Pliny, he was employed by Praxiteles to colour marble statues. Among his chief works were 'Necromantia Homerii,' 'Calypso,' 'Diana,' and 'Ilyachthus.'

Nicias (c. 470-414 B.C.), Athenian statesman and general, belonging to the aristocratic party. He was sev. times a colleague of Pericles in the strategia, and on the death of the latter became leader of the aristocrats, and opposed Cleon. Prior to the Sicilian expedition he achieved a number of minor successes, and in 421 took a prominent part in the peace of N., which terminated the first part of the Peloponnesian war. In 418 he was one of the commanders in the naval expedition against Sicily; after the flight of Alcibiades, was practically the sole commander. In 414 B.C. he led the great expedition to Syracuse; but the enterprise terminated in disaster, and he was put to death by the Syracusans. See Plutarch's *Nicias*.

Nickel, one of the transitional elements of the first long period of the periodic table. The primary physical constants are: electron configuration, 2, 8, 16, 2, i.e. atomic number 28; atomic weight 58.69; density 8.9; melting point 1432° C.; electrical conductivity 12.9 (silver = 100); thermal conductivity 0.14 cal./cm.²/cm./°C./sec.; crystal structure: α-nickel, hexagonal close-packed; β-nickel, face-centred cubic; symbol Ni.

The name N. is derived from the term 'kupfer-nickel' applied derisively by the old Westphalian miners to an ore resembling copper, actually N. arsenide, from

which no copper could be extracted and was therefore believed to be 'bedevilled.' In 1751 Cronstedt obtained impure malleable N. from this ore. The two most important sources are New Caledonia in the S. Pacific, and near Sudbury in Ontario. The New Caledonian ore is garnierite, $(\text{MgNi})\text{O}_3\text{SiO}_4\text{H}_2\text{O}$, containing up to 35 per cent of N. but averaging about 6 to 7 per cent; 6000 short tons were produced in 1937. The Sudbury ore is pentlandite, $(\text{FeNiS})_2$ to $\text{NiS} \cdot 2\text{FeS}$, averaging 2 to 3 per cent; 102,000 short tons were produced in 1937. The method of extracting the N. from the ore depends upon the type of ore. The Sudbury ore, being associated with copper, is smelted to a copper-N. matte from which the N. is extracted by the Orford 'tops and bottoms' process of the International Nickel Company and may be refined by the Mond carbonyl process or by electro-deposition. The New Caledonian ore is simpler to deal with since no separation from copper is necessary, but iron has to be removed by conversion before the matte is roasted to oxide which is reduced to metal by coal.

Details of the processes are as follows: The Canadian ore analyses at copper, 1-2 per cent; nickel, 2-4 per cent; iron, 40 per cent; silicon, 25 per cent; sulphur, 20 per cent; alumina, etc., 10 per cent. The stages of extraction are: (i.) By differential froth flotation it is possible to obtain two concentrates. The first to rise to the surface is mainly copper and is treated for extraction of this. After adjustment of the conditions most of the N. plus the remaining copper comes up. (ii.) The copper-N. concentrate is roasted in a multi-hearth MacDougall furnace, the reaction being self-supporting, which reduces the sulphur content from 28 per cent to 16 per cent. (iii.) Smelting in a reverberatory furnace follows; the product is copper-N.-iron matte, containing 25 per cent N., on which the gangue floats and can be tapped off. (iv.) The matte is converted to oxidise the iron and flux it off as a ferro-silicate slag. The blow is not continued any longer than is required to remove the iron, because over-conversion would oxidise the N. sulphide to oxide which would be lost in the slag. The resulting matte, containing 80 per cent N., together with copper, is the raw material of the Orford process, which is based on the fact that if mixed copper and N. sulphides are fused with sodium sulphide the mass separates, on solidification, into two layers, the 'bottoms' being mainly N. sulphide and the 'tops' a mixture of sodium and copper sulphides. The reaction takes place in a blast furnace in the presence of coke, the product being allowed to separate in 6-ton pots. The 'bottoms' are ground, washed, and sintered to oxide: $2\text{NiS} + 3\text{O}_2 \rightarrow 2\text{NiO} + 2\text{SO}_2$. The oxide is reduced to metallic N. by coal in a reverberatory furnace: $2\text{NiO} + \text{C} \rightarrow 2\text{Ni} + \text{CO}_2$. In the Mond refining process, originated by Mond, Lager, and Herz, and used by the International Nickel Company near Swansea, the Orford 'bottoms' are crushed, ground, washed,

and roasted at 700°C . to produce N. oxide. This is reduced to metal by heating it at $350-400^\circ\text{C}$. in an atmosphere of water-gas; 97 per cent of the reduction is done by the hydrogen and only 3 per cent by the carbon monoxide: $\text{NiO} + \text{H}_2 \rightarrow \text{Ni} + \text{H}_2\text{O}$. Next carbon monoxide is passed over the N. and forms volatile N. carbonyl: $\text{Ni} + 4\text{CO} \rightarrow \text{Ni}(\text{CO})_4$. The temp. is 60°C ., maintained by the exothermic nature of the reaction. Finally the carbonyl is decomposed by passing it over N. pellets at 180°C ., the newly formed N. deposits on the pellets releasing carbon monoxide for further use. The product of the Orford process may also be purified by electrolysing a N. sulphate solution containing also sodium sulphate and boric acid. The copper which goes into solution from the impure N. anodes is kept on the cathodes by placing the latter in a canvas compartment and maintaining a head of copper-free solution round them. The copper-contaminated solution is pumped into a separate tank where copper and iron are precipitated and removed before the solution is recirculated to the cathode compartment.

The New Caledonian garnierite is first smelted with gypsum and coke in a blast furnace, the product being a N.-iron matte containing 30-45 per cent of N. as sulphide. This is treated in a Bessemer converter in which the iron is removed as a silicate slag and the sulphur partially oxidised away. The N. sulphide is roasted to oxide, which in turn is reduced to metal by mixing it with coal and heating in either retorts or reverberatory furnaces.

Pure N. is used as a catalyst, for plating, and for some laboratory apparatus such as crucibles, spatulas, etc., where its resistance to oxidation is useful. N. is ferro-magnetic at room temp., but becomes non-magnetic when heated above 365°C . When N. is alloyed with iron the magnetic change temp. of the resulting solid solution decreases as the percentage of N. increases until at about 30 per cent N. the alloy is non-magnetic at room temp. With further addition of N. the magnetic permeability increases again and reaches a peak at about 78 per cent of N. The alloy of this composition is called permalloy. A similar alloy is mu-metal: 74 per cent nickel, 20 per cent iron, 5.3 per cent copper, 0.7 per cent manganese. Both are used where high permeability at low field strength is required. The addition of N. to iron also gives rise to a reduction of thermal expansion until at 36 per cent N. the alloy in var is produced which has zero coefficient of expansion. The alloy of 80 per cent N. with 20 per cent chromium is widely used as electrical resistance heating elements in furnaces because of its resistance to scaling at temps. up to 1000°C . A development of this basic composition is nimonic, a standard alloy for the blades and other high temp. parts of the gas-turbine where creep resistance at high temps. is required.

All alloys of N. with copper are of the solid solution type, hence they are all

particularly amenable to cold-rolling, -drawing, -forging, etc. Examples include Monel metal, 70 per cent N., 30 per cent copper, with small amounts of iron and manganese, noted for its high resistance to many corrosive agencies; 80/20 cupro-N. is extensively used for marine condensers because of its freedom from corrosion and season cracking. The term 'N. silver' applies to a wide range of alloys which contain no silver whatever; they are essentially 70/30 brass with the addition of up to 30 per cent of N. The higher the N. content the whiter the colour. The N. silvers also have good corrosion resistance and are used for spoons, forks, tureens, etc., generally in the electro-plated condition (E.P.N.S.). Alnico is an aluminium-cobalt-N. alloy developed to give the high B-H values required for permanent magnets. N. is also present in small percentages in many other alloys, e.g. up to 2 per cent in bronzes and aluminium alloys, and is a valuable constituent of many alloy steels.

Nickel Steels.—N., when added to a plain carbon steel in small percentages, dissolves in the ferrite which it stiffens and so increases the tensile strength of the steel at the rate of about 2 tons/in.² for every 1 per cent added, but there is hardly any loss of ductility, e.g. 3½ per cent N. in an annealed 0·30 per cent carbon steel increased the tensile strength from 30 tons/in.² to 40 tons/in.², with a slight improvement in ductility. Further additions of N., however, render the gamma-alpha change so sluggish that, depending upon the carbon content, some of the brittle constituent, martensite, begins to appear in the structure of even the annealed steel at about 8 per cent N. and the ductility falls off markedly. At about 15 per cent N. the ductility begins to improve again, accompanied by a fall in tensile strength, because the softer gamma constituent, austenite, begins to appear. At 30 per cent N. the transformation has become depressed to below room temp., and the alloy is wholly austenitic and non-magnetic. For ordinary structural purposes the N. content seldom exceeds 5 per cent because (a) N. is an expensive metal and the improvement in properties is more rapid for the first 5 per cent than for subsequent additions, and (b) steels containing much more than 5 per cent N. are more difficult to forge. The effect of N. on the properties is illustrated by the following figures:

measured by the Izod impact value, is also improved as shown in the above table. In another example a 3½ per cent N. steel and a carbon steel were both heat-treated to 50 tons/in.² tensile strength; the impact values were 58 and 45 foot-pounds respectively.

N. steels permit a much slower rate of cooling from hardening temp. without loss of hardness, and the depth to which the steel hardens is much greater than in carbon steels. For this reason oil may be used as the quenching medium and the risk of distortion of complicated structures is minimised. At the same time, large bars 6 in. in diameter or more will attain almost the same hardness at the centre as at the outside, a condition impossible with a carbon steel. On account of the slow rate of grain growth of N. steels excessive grain size does not result from high forging and hardening temps. These properties are the result of the slow rate of diffusion of N. in the solid state and the consequent sluggishness of the steel transformations. The austenitic 30 per cent N. steels find application, with the addition of other alloys, where hot strength and resistance to high temp. scaling are important, e.g. gas and steam turbine blading and engine valves.

Nickel-chrome Steels.—The combination of N. and chromium together in structural steels offers advantages which cannot be obtained with equivalent amounts of either of these elements alone. A few of these advantages are higher elastic ratio, greater hardness and higher impact and fatigue resistance, and resistance to abrasion. Chromium inhibits the tendency of N. to graphitise the iron carbide, a function performed by manganese in N. steels, and therefore less manganese is used in N.-chrome steels. Chromium, like N., also suppresses the transformation temp. of the steel and therefore increases the deep-hardening and air-hardening properties. The latter is influenced by the N. content, e.g. a steel containing 1 per cent chromium and 3 per cent N. air-harden markedly, while with the same amount of chromium and only 1–2 per cent of N. present air-hardening is not appreciable. A 4½ per cent N., 14–14 per cent chromium steel is fully air-hardening. A popular range of N.-chrome steels contains 0·25–0·4 per cent carbon, 1 per cent chromium, and 2·5–3·5 per cent N. By oil quenching

	Carbon per cent	Nickel per cent	Tensile strength tons/in. ²	Yield Point tons/in. ²	Elongation per cent	Reduction of area per cent	Izod Impact ft.-lb.
Carbon steel	0·31	nill	39	29	28	66	55
Nickel steel	0·31	3·25	53	43	22	66	61

(Both steels had been quenched and then tempered at 600° C.)

In addition to the enhanced combination of strength and ductility which up to 5 per cent of N. confers upon steel, another property, resistance to shock as

and tempering at appropriate temps. a wide range of properties is possible. Despite the high tensile strength range of 50–65 tons/in.² the steels machine well

in the fully heat-treated condition and can therefore be put into service as connecting-rods, axles, gears, crankshafts, etc., without further heat-treatment. Stainless steel is an 18 per cent N., 8 per cent chromium steel which has very high resistance to corrosion. Being austenitic it cannot be hardened and tempered.

Nickel-chrome-molybdenum Steels.—N.-chrome steels suffer from temper brittleness if air-cooled from tempering. To avoid this oil-cooling is necessary. Alternatively the incorporation of small amounts of molybdenum achieves the same object; 0·25–0·30 per cent is usual.

Nickel Silver, see GERMAN SILVER.

Nicobar Islands, group of nineteen is. in the bay of Bengal, between 6° 45' and 9° 15' N. and 93° and 94° E., between Sumatra and the Andaman Is., and under the same prov. administration as the latter, as a prov. of India. The Dutch ceded the group to the Brit. in 1869. The is., of which only twelve are inhabited, have an aggregate area of about 635 sq. m. There are two groups, Great and Little Nicobar, and sev. others to the S., and Car Nicobar, Camorta, and the remainder to the N., separated by Somboro Channel, 36 mi. broad. Great Nicobar is the largest is., with an area of 333 sq. m., and Car Nicobar (49 sq. m.) is the most densely populated (4000). The best harbour is Nankauri, formed by Camorta and Nankauri. The coco-nut is the prin. tree grown, 3,000,000 nuts being produced annually; betel nuts are also found. The fauna of the is. includes monkeys, bats, flying-foxes, tree-shrews, many varieties of birds and reptiles, and also of butterflies and insects. The inhab. are a Far E. race and speak varieties of the Mon-Annam group of languages; their appearance is somewhat repulsive, but the mental capacity of the best of them (natives of Car Nicobar) is considerable. The religion is a form of animism; there is a Church of England missionary station under the supervision of native Indians. The is. were occupied by Jap. forces from March 1942 until 1945. Pop. 11,000.

Nicodemus, Pharisee and member of the Sanhedrin, described as a 'man of authority among the Jews' (John iii.). Jesus, early in his teaching won his secret allegiance and held with him the memorable discourse on the new birth. Jesus styles him 'the teacher of Israel,' probably implying such a function as interpretation of the law. Cautious, even timid, N. sought Jesus by night to avoid critical eyes. Yet in the Sanhedrin, when his colleagues proposed to condemn Jesus unheard, N. had the courage to risk suspicion by contending for a fair and legal procedure. In the end he freely associated himself with Joseph of Arimathea in providing honourable burial for the Crucified in the rock-hewn garden-grave of Joseph.

Nicodemus, The Gospel of, Apocryphal writing which had much influence on the religious thought of medieval times, consisted of two distinct works. The first

contains an account of the trial of Christ before Pilate, a work which seems to have been extant separately under the title of *Acta Pilati*. It is for the most part a compilation of excerpts from the accounts of Christ's trial in the canonical gospels. This work exists in sev. forms, both in Gk. and Lat., in some of which Nicodemus writes the work in Heb.; in others he is represented as translating it into Gk. In style it appears to be the work of a Jew. The two Gk. forms seem to have emanated from a common source composed early in the second century. The second part, *Descentus ad Inferos*, is a much more rhetorical production. It purports to be by Simeon and his two sons, who had risen from the dead at Christ's resurrection. They describe what took place in Hades when Christ descended there. It was written, possibly, in the third century. The old legend according to which Joseph of Arimathea brought Christianity to Britain in the time of Vespasian, and on which Robert de Boron based his poem on the grail or cup of Christ's passion and the table of the Last Supper, is in some way connected with the anct. popular G. of N.

Nicol, Erskine (1825–1904), Scottish painter, was b. at Leith. He lived in Ireland from 1845 to 1849, and returning to Edinburgh was elected a member of the Scottish Academy. In 1862 he settled in London. His paintings, the best of which are scenes of Irish life and customs, include 'Among the Old Masters,' 'Both Puzzled,' 'Paying the Rent,' 'The Trio,' and 'Interviewing the Member.'

Nicolai, Carl Otto Ehrenfried (1810–49), Ger. musician and operatic composer, was b. at Konigsberg. From 1841 to 1847 he was first kapellmeister of the Court Opera at Vienna, and was the founder of the Philharmonic concerts there. He produced sev. operas, all successful, the best known of which are *Il Templario* (1840) and *The Merry Wives of Windsor* (1849). See life by G. R. Kruser, 1911.

Nicolai, Christoph Friedrich (1733–1811), Ger. author and publisher, b. in Berlin. In his youth he was a friend of Lessing and Moses Mendelssohn, and in conjunction with the former he estab. the famous *Bruce, die neueste Literatur betreffend* (1759–65). Gradually he began to attack the romantic movement and critical school, and foolishly misrepresented the new movement of ideas represented by such great thinkers as Goethe, Schiller, Kant, and Herder. His works include *Description of a Trip through Germany and Switzerland* (1783); *Anecdotes of Frederick II.* (1788–92); and a rationalistic novel, entitled *Sebaldus Nothunker* (1773–76). See lives by R. Amer, 1912, and F. C. A. Phillips, 1926.

Nicolaitans, heretical sect of the Christian Church, fl. in the second century. Their cult of libertinism was probably evolved from pagan rites and a rejection of the rules of Deuteronomy xxiii. There are links with the doctrines of Balaam (Rev. ii. 14; Jude; 2 Peter, i.).

Nicolas, Saint. see NICOLAS.

Nicolas, Sir Nicholas Harris (1799–

1848), Eng. antiquary and biographical writer, b. at Dartmouth, Devon (though his family, originally Breton, had been settled in Looe, Cornwall, since 1685). In 1823 he pub. his *Index to the Heralds' Visitations in the British Museum*. Among the most important of his works are *Nolitia Historica* (1824); *Despatches and Letters of Lord Nelson* (1884-88); *Life of Chaucer; History of the Battle of Agincourt* (1827); and an unfinished *History of the Royal Navy* (1847).

Nicole, Pierre (1625-95), Fr. theologian and philosopher, was b. at Chartres. His most important work is a collection of treatises called *Moral Essays and Theological Instructions* (1671-78). He also wrote a *Treatise on Human Faith, and The Perpetuity of Faith in the Catholic Church concerning the Eucharist* (1669-74), the last in conjunction with Arnauld. Together with Arnauld, Le Maistre, Lancelot, and others of the most distinguished scholars of the age, N. was a permanent inmate of the community of Port Royal, best known for its adhesion to the Jansenist movement.

Nicolet, tn. of Quebec, Canada, in the co. of N., 20 m. N.E. of Montreal. Pop. about 4000.

Nicoll, Allardyce (b. 1894), Eng. literary historian and biographer, b. at Glasgow and educated at Glasgow Univ. Before the Second World War, N. was prof. of drama and head of the dept. of drama at Yale Univ., U.S.A., and later became prof. of Eng. at Birmingham Univ. His most detailed work has been done on drama and the theatre, and he has spent sev. years in compiling a study, in seven vols., of Eng. drama from 1660 to 1900. He has also pub. *Masks, Mimes, and Miracles* (1931), on popular drama, *The Development of the Theatre* (1948); and *World Drama* (1949); as well as biographies of Wm. Blake (1922), John Dryden (1923), and other poets.

Nicoll, Robert (1814-37), Scottish poet, b. at Auchtergarvan, Perthshire. His first poems were printed in 1835. He ed. the *Leeds Times*, from 1836, successfully, but is chiefly remembered as a Scottish minstrel. Had his life not been cut short, N. would probably have attained great distinction. See life by P. R. Drummond, 1884.

Nicoll, Sir William Robertson (1851-1923), Scottish author and critic, was b. at Lumden, Aberdeenshire. He was Free Church minister of Dufftown, 1874-77, and later of Kelso. He then came to London and ed. the *Expositor and British Weekly*, together with the *Bookman*, estab. by him in 1891. He was editor of the *British Weekly* for the rest of his life. His publs. include *Songs of Rest* (1879); *Life of James Macdonnel* (1890); *Anecdotes of the Nineteenth Century* (1895-96); *The Expositor's Dictionary of Texts* (1897); *Letters on Life* (1901); *The Church's One Foundation* (1901); a life of 'Ian MacLaren' (1908); and *Professor Elmali* (1911). He also ed. the complete works of Emily Brontë (1910).

Nicolle, Charles Louis Henry (1866-1936), bacteriologist, b. at Rouen. Ap-

pointed director of the Pasteur Institute at Tunis, he studied N. African infectious diseases, discovering the transmission of the typhus bacillus by lice. In 1928 he received the Nobel prize for medicine. In 1932 he became prof. at the College de France in Paris.

Nicolson, Harold (b. 1886), Eng. diplomat, historian, and biographer, b. at Teheran, where his father, who later became Baron Carnock, permanent under-secretary at the Foreign Office, was minister. Educated at Wellington and Balliol College, Oxford, N. entered the Foreign Office in 1909 and served in the embassies at Madrid and Constantinople. He married in 1913 Victoria Sackville-West (q.v.). He was a member of the Brit. delegation to Versailles in 1919, and was lent to the League of Nations staff from 1919 to 1920. He accompanied Lord Curzon to Lausanne, and subsequently became counsellor to the legation at Teheran until his transfer to Berlin in 1927. In 1929 he retired from the diplomatic service to devote himself to politics. He was one of the early members of Sir O. Mosley's New party (q.v.) in 1931, but left the party when its Fascist tendencies became more overt. At the general election of 1935 he was returned as National Labour member for W. Leicester, and became a junior minister in the Churchill Gov. of 1940. He joined the Labour party in 1947 and stood unsuccessfully for N. Croydon in the by-election in that year. He was entrusted with the official biography of George V. N.'s political career is of much less importance than his writings, and it is by these that he will be remembered. His wide culture and sympathy has enabled him to present a diverse selection of subjects, enlightened by a capacity for sharp impressions and built by strong powers of construction. His publs. include (novels) *Some People* (1927); *Secret Waters* (1932); *Public Fares* (1932); *The Desire to Please* (1913); (biographies) *Paul Verlaine* (1921); *Tennyson* (1923); *Byron: the Last Journey, 1823-24* (1924); *Swinburne* (1928); *Lord Carnock* (1930); *Curzon: the Last Phase* (1934); *Dwight Morrow* (1935); *Benjamin Constant* (1949); (hist.) *Peacemaking* (1933); *The Congress of Vienna* (1946); (essay) *Small Talk* (1937); *Marginal Comment* (1939); *Comments 1944-48* (1948). The last three are collected contributions to the *Speaker*.

Nicolson, William (1655-1727), Eng. prelate and antiquary, was b. in Cumberland. He occupied the sees of Carlisle and Derry, and finally rose to be archbishop of Cashel in Ireland. His prin. work was the 'Historical Library,' consisting of Eng., Scottish, and Irish sections. He also contributed a *Glossarium Northernum-Hymbricum* to Ray's *Collection of English Words*.

Nicol's Prism, see POLARISATION OF LIGHT.

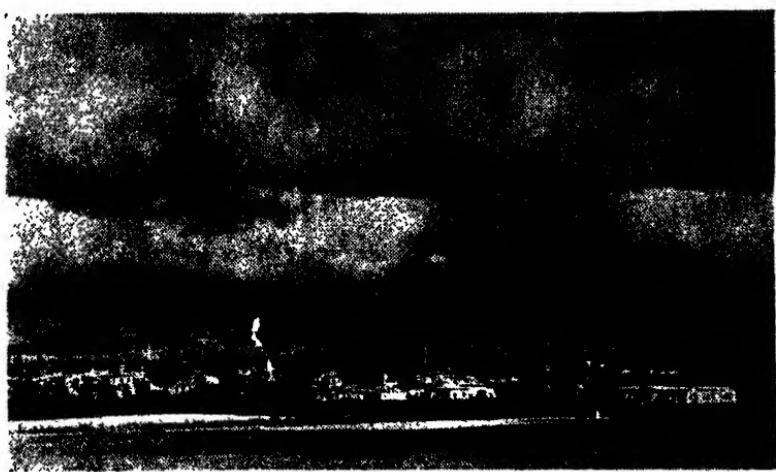
Nicomachus (fl. c. 400 B.C.), Gk. physician of Macedonia, was the father of Aristotle. He was patronised by Amyntas II., king of Macedonia.

Nicomachus of Thebes (*f. c. 400 B.C.*), celebrated Gk. painter, son of Aristodemus (*q.v.*), whose pupil he became. He is one of the most remarkable of the painters of antiquity. His skill is praised by Cicero, and he was renowned for his rapidity of execution. Among his prin. works were 'Apollo and Diana,' 'The Rape of Proserpine,' and 'The Tyndaridae.'

Nicomedes, name of three kings of Bithynia: *Nicomedes I.* began to reign in 278 B.C., and founded the great city of Nicomedia. He *d. c. 250 B.C.* *Nicomedes II.* was sent by his father, Prusias II., as hostage to Rome, where he found favour with the Rom. senate, and later dethroned and killed his father, and

an altitude of nearly 3000 ft., and possesses a fine Norman cathedral and sev. churches. The tn. is full of crusaders' tombs, many of them with Eng. names upon them. In the Second World War sev. churches were damaged, including the Carmine, S. Michele, S. Salvatore, and S. Vincenzo, but repairs were soon effected. Salt is mined and near by are sulphur springs. Pop. 15,960.

Nicosia (or Lefkosa), cap. of the is. of Cyprus and a Gk. Orthodox archbishopric, lies near the centre of the great plain of the Mesaoria, on the r. b. of the R. Pedias, 25 m. from its port, Larnaca. The tn. presents a quaint, old-world aspect and has interesting memorials of



E.N.A.

NICOSIA AND THE MESAORIA PLAIN

became an ally of the Romans. He *d.* about 90 B.C. *Nicomedes III.*, son of the preceding, succeeded his father. He also was an ally of Rome, but was defeated and driven from his kingdom, which was, however, subsequently restored to him. He *d.* in 74 B.C., leaving no issue, and Bithynia passed to the Romans.

Nicomedia (modern Ismid), anct. city of Bithynia, Asia Minor, at the N.E. corner of the gulf of that name, an arm of the sea of Marmora. It was the seat of the Bithynian kings, and the abode of Hannibal, Diocletian, Constantine, and Arrian the historian. See further under ISMID.

Nicopolis (Bulgaria), see NIKOPOLI.

Nicopolis (Gk. city of victory), anct. city of Epirus, Greece. It was situated on the gulf of Arta, and was founded by Octavian to commemorate his victory at Actium in 31 B.C. Many Rom. antiquities are to be seen on the site.

Nicosia, tn. of Sicily, in the prov. of Cetania, 14 m. N.E. of Castrogiovanni. The surrounding dist. is fertile. N. has

its former Venetian rule in the shape of its anct. cathedral and bastion walls. Textile goods and leather are the prin. manufs. It is the seat of the Brit. governor. Pop. 35,000 (mostly Turks).

N. does not appear as the cap. until the Lusignan dynasty but the great number of anct. tombs going back to 3,000 B.C. indicates that this was the site of a city from remote times. It is suggested that the site of the present tn. may have been the city of Ledra, founded by Leodcon, son of Ptolemy Soter (280 B.C.). The earliest mention of N. (as Cossia) is that made by Wilbrand, count of Oldenburg, in 1211 (see Cobham, *Excerpta Cyriæ*, 1908). Dante, in *Paradiso*, refers to its luxurious life under its king, Henry II., and it was here that St. Louis of France estab. himself with that monarch when on his way to the fourth crusade. The period of luxury ended in the early fifteenth century when the Mamelukes landed in the is. and marched on N., which they pillaged in 1426. At the end of the fifteenth century N. had 250 churches and 50,000

inhab., chiefly Its., Fr., Gks., and various peoples of the middle E. countries and Ethiopia, and the circuit of the city extended for 7 m. The Venetians, who were then in military occupation, began to fortify the is. against an expected Turkish assault (1567). In fortifying the city they destroyed everything outside their new circumvallation, including the monastery and royal castle of St. Domenico. In 1570 the long-expect ed siege of N. was launched by Mustapha Pasha, whose army spent two months in reducing the place. It is said that 20,000 Christians were slain in the street fighting which followed the fall. The 300 years of Turkish occupation were, generally, uneventful.

In 1741 N. was damaged by an earthquake and a minaret of S. Sofia Cathedral fell to the ground. In 1878 the Brit. Admiralty ordered Vice-Adm. Lord John Hay, then off Crete, to take over Cyprus and to raise the Eng. flag over N. These instructions were carried out. The Paphos Gate, known in the Middle Ages as the Porta Domenico, was closed by the Eng., when they made a new entrance through the city walls. The anet. Franciscan church was destroyed in the great siege, but a new church, the Rom. Catholic church of St. Cross, took its place. The Armenian church of the Blessed Virgin Mary was formerly the Benedictine abbey of our Lady of Tyre. During the siege of 1570 the Armenians, out of hatred for the Lats., helped the Turks and received this church as a reward. Near the law courts and in the centre of the Konak Square is the Venetian column, the symbol of Venetian domination erected in the various colonies held by the republic, and which was once crowned by the Lion of St. Mark. It was taken down by the Turks but restored to its present position in 1917. It is a monolith of grey granite and probably came from a temple of Salamis. The Kyrenia Gate, also erected by the Venetians, has in recent years been isolated and new entrances cut in the walls on each side of it. St. Sofia, once the cathedral and now the prin. mosque of N., stands in the centre of N. and its twin minarets are a prominent landmark. It is built after the plan of a Fr. cathedral of the thirteenth century and its chief feature is the parvis, with its three splendidly decorated doorways comparable with any in Europe. Opposite the E. door of the cathedral is the Turkish library founded by Sultan Mahmud last century. Another notable building is the Bedestan, which has been erroneously supposed to be the church of St. Nicholas founded in memory of Thomas a Becket, and which was, prior to 1570, the Orthodox metropolis of the Venetian period in N. St. Catherine, now known as Haldar Pasha, after the cathedral, the most important Gothic building remaining in N., was erected towards the end of the fourteenth century. The Famagusta Gate was the chief gate of the city and is the prin. monument of the Venetian era in N. It

is built as a copy of the Lazaretto Gate at Candia. Its central dome is reminiscent of the Pantheon in Rome. The Orthodox bishopric, or church of St. John, is probably built on the same site as the old abbey of St. John the Evangelist, which belonged to the Benedictines. For other monuments see Sir R. Storrs and B. J. O'Brien, *Handbook of Cyprus*, 1930; R. Gunnis, *Historic Cyprus*, 1936. During the riots of 1931, which were fomented by agitators for union with Greece (*enosis*), Gov. House was burned down (see under CYPRUS).

Nicot, Jean, Sieur de Villemain (1530-1600). Fr. diplomatist and philologist, was b. at Nîmes. In 1560, during the reign of Henry II., he was sent as ambas. to Lisbon. On his return from Portugal he introduced the tobacco plant into France (hence the name nicotine). N. was the author of *Historia Francorum* and *Le Trésor de la langue française*.

Nicotera, Giovanni, Baron (1828-91). It. statesman, was b. at San Biagio, Calabria. For his part in revolutionary movements he was condemned to the gallows. He was, however, set free in 1860 by the revolutionists and joined Garibaldi. Seven years later he commanded an expedition against Rome. In the Parliament of the new kingdom of Italy he took a foremost part, and was a consistent supporter of Victor Emmanuel. He was minister of the interior in the first Crispi cabinet, under Depretis (1876-77), and again in 1891-92, under Rudini.

Nicotiana, genus of plants (family Solanaceae), a number of which are grown in the garden as half-hardy annuals. *N. alba*, the sweet-scented tobacco plant, bears panicles of white funnel and star-shaped flowers. *N. Tobacum* is the tobacco plant of commerce.

Nicotianin, volatile oil to which tobacco owes its flavour. It contains four alkaloids: nicotine, niotinine, nicotine, and nicotelline.

Nicotine ($C_{10}H_{14}N_2$), alkaloid found in the leaves of the tobacco plant in the form of the malate and citrate. It may be prepared by extracting the oil from the leaves with boiling water, mixing it with milk of lime, and distilling; the distillate is treated with oxalic acid, concentrated, treated with potash, and the N. extracted with ether. N. is a colourless oil, but rapidly turns brown on exposure to air. It boils at 216-273° C. and readily dissolves in water and alcohol. It has a pungent odour, similar to that of foul tobacco pipe. N. is exceedingly poisonous, a few drops in the stomach being sufficient to cause death, while a grain has been known to cause symptoms of poisoning. N. is used as an insecticide in greenhouses, etc. It was synthesised in 1904.

Nicotinamide. See NICOTINIC ACID.

Nicotinic Acid and Nicotinamide. N. A. oxidation product of nicotine, is the β monocarboxylic acid of pyridine (C_6H_5COOH). It has the formula NC_6H_4COOH . It is one of the vitamins of the B₁ complex. It occurs in liver, yeast, wheat, rice, etc.,

and is said to be so stable that it has been detected in barley taken from the tomb of Tutankhamen (1350 B.C.). Shortage of N. A. in the diet is responsible for the skin disease of pellagra (*q.v.*), which is common in peoples living chiefly on maize. Nicotinamide ($\text{NC}_6\text{H}_4\text{-CO-NH}_2$) is the acid amide of N. A. and has similar physiological properties to the acid itself. Diethylnicotinamide ($\text{NC}_6\text{H}_4\text{-CO-N(C}_2\text{H}_5)_2$) is used in medicine (under the trade name of 'Coramine') for its action on the medulla of the brain, where by stimulating the respiratory centre it accelerates breathing and by its action on the vaso-motor centre it raises the blood pressure; hence it is useful in reviving people who have collapsed, *e.g.* on the operating table.

Nictheroy, or **Niteroi**, residential quarter of Buenos Aires, standing on the opposite shore of the harbour, with which it is connected by ferries. It has fine, prov. gov. buildings and handsome private houses. Many Brit. and Amer. families live here. When the port installations are completed N. will become a port of call for transatlantic shipping. Pop. 162,600.

Nidaros, *see TRONDHJEM*.

Nidderdale, picturesque vale of Yorkshire, situated in the W. riding, traversed by the Nidd, which issues from the base of Whernside, and after a generally S.E. course empties into the Ouse near York. Water is supplied to Bradford from a dam above Pateley Bridge.

Nidwalden, *see UNTERWALDEN*.

Niebuhr, Bartold Georg (1776-1831), Ger. statesman and historian, was b. at Copenhagen, son of the traveller, Carsten N. (*q.v.*). In 1810 he became royal historiographer and prof. at Berlin, and by a course of lectures on Rom. hist. estab. his position as one of the most original and philosophical of modern historians. In 1816 he went to Rome as Prussian ambassador, and during his residence there discovered and pub. fragments of Cicero and Livy, and contributed to the great work on the topography of ant. Rome by C. C. von Bunsen and L. Platner (1773-1855). He resigned the embassy in 1823 and settled at Bonn, where he spent practically the whole of the remainder of his life. Here he re-wrote and pub. the first two vols. of his *Roman History* (first pub. 1811-12) and delivered lectures on the Fr. revolution, geography, ethnography, and ant. hist. The first two vols. were trans. (1828) by J. C. Hare and C. Thirwall, and the third (bringing the narrative down to the end of the first Punic war) by Smith and L. Schmitz.

See D. Hensler, Lebensnachrichten, 1838-1839; and lives by J. Classen, 1876; Eissenhart, 1886; and F. Schnabel, 1931.

Niebuhr, Carsten (1733-1815). Ger. traveller and author, was b. at Lüdingworth, Hanover. In 1761 he joined an expedition sent out by the king of Denmark for the scientific exploration of Egypt, Arabia, and Syria. He returned in 1767 as the sole survivor. In 1778 he accepted a position in the civil service of Holstein and went to live at Meldorf.

The result of his travels appeared in his *Beschreibung von Arabien* (1772), followed by *Reisebeschreibung von Arabien und andern umliegenden Ländern* (1774-78), and *Reisen durch Syrien und Palästina* (1837). See life by his son, B. G. Niebuhr, 1817 (Eng. trans., 1828, by Mrs. Austin, in the *Lives of Eminent Men* series).

Niebuhr, Reinhold (b. 1892), Amer. protestant theologian, b. at Wright city, Missouri. Prof. for applied Christianity (Christian ethics) at the Union Theological Seminary, New York. He expounds a biblical theology, orientated to the present day, which has found some acceptance outside the U.S.A. See E. L. Allen, *Christianity and Society: an Introduction to the Thought of Reinhold Niebuhr*, 1949.

Nieder Hermendorf, *see HERMENDORF*.
Niedersachsen, *see SAXONY, LOWER*.

Niederwald, mt. ridge in Wiesbaden, Hesse, Germany, crowned by the Ger. national monument erected in 1883 in commemoration of the estab. of the empire in 1871. It is on the r. b. of the Rhine, opposite Bingen, between Rudesheim and Assmannshausen, and has an elevation of about 1150 ft. above sea level, 900 ft. above the Rhine. The summit is approached by a cog-wheel railway.

Niegoš, Petrović, *see ĐANILO I*.

Niel, Adolphe (1802-69), Fr. marshal, was b. at Muret, Haute-Garonne, France. He served in Africa, and distinguished himself at the capture of Constantine in 1837. In 1849 he was engaged in the siege of Rome, and took the Malakoff redoubt near Sebastopol in 1855; three years later he pub. *Le Siège de Sébastopol*. He again distinguished himself in the battle of Solferino, 1859, when Napoleon III. made him marshal. N. was appointed minister of war in 1867.

Niel, Belgian tn. on the R. Rupel, 9 m. S.W. by S. of Antwerp. There are brick-kilns and manuf. of pantiles, floor-tiles, cement and pottery. There are also small shipyards. Pop. 10,800.

Niello (It. form of Lat. *nigellum*, diminutive of *niger*, black), name of the method of ornamenting a polished metal surface by filling in incised lines with a black metallic amalgam, which has been practised from very early times up to the present day. The amalgam is made up of silver, copper, and lead, heated and then poured into flowers of sulphur. The earliest specimens of N. date from Rom. times. The use of N. has also been revived by a few Eng. craftsmen. The invention of printing from engravings on metal plates was undoubtedly suggested in great measure by N. See A. M. Hind, *Niello, chiefly Italian of the fifteenth century*, in the British Museum, 1936.

Nielsen, Carl August (1865-1931), Danish conductor, composer, and musicologist, b. Nørre-Lyndelse. Being poor as a youth, he joined a military band at the age of fourteen, but at eighteen succeeded in entering the Copenhagen conservatory as a pupil of Gade. In 1891 he entered

the royal orchestra and was its conductor in 1908–14. He also became conductor of the Musical Society and director of the conservatory. With an independent style and a strong sense of counterpoint and melody, N. is one of the most important of Scandinavian composers. Works include (operas) *Saul og David* (1903); *Maskarade* (after Holberg) (1907); and others; incidental music for Oehlenschläger's *Aladdin*; six symphonies (II. *The Four Temperaments*, III. *Es-pansira*, VI. *Sinfonia semplice*), *Saga-Dream* for orchestra; violin and piano-forte sonata, etc.

Niernbsch (or Niemsch), Nikolaus von Strehlenau, see LENAU, NIKOLAUS.

Niemcewicz, Julian Ursin (1757–1841), Polish scholar and statesman, was b. in Lithuania. He served for a short time in the army and became acquainted with Kosciusko, with whom he was taken prisoner at the battle of Maciejowice in 1794, and was secretary of state and president of the Constitutional Committee in Poland after the Congress of Vienna. Of his works the *Historical Ballads* (1816) are the most popular, but he also wrote *The Return of the Deputy*, a comedy; *John of Tenczyn*, a novel in the style of Scott; and a *History of the Reign of Sigismund III.* (3 vols.) (1819). See life by A. Czartoryski 1860.

Niemen River (Russia), see MEMEL.

Niemöller, Martin (b. 1892), Ger. pastor of the Protestant Evangelical Church and theologian, b. at Lippstadt, Westphalia. Served in the First World War as a naval lieutenant and U-boat commander. Ordained in 1924, N. became pastor of the wealthy Berlin-Dahlem par. (1931–37). A strong supporter of nationalism and opponent of communism, he welcomed National Socialism (q.v.) and joined the Nazi party, but in 1933 he led a campaign against the state totalitarian control of the Lutheran Church and became thereafter an opponent of the Nazi regime. When the Nazis caused a schism in the Church, setting up the 'Ger. Christians' with a Nazi-inspired programme, thereby virtually establishing the supremacy of the State and its teaching over the Church and its fundamental principles, (including the adoption of the Aryan paragraph (see ARYAN), N. assumed the leadership of the Confessional Church Bekennntniskirche), which remained true to Evangelical principles. He also founded the Pastor's Emergency League (Pfarrennotbund) to defend the Lutheran faith, and helped to draw up the 'six principles' of the Confessional Church at the synod of Barmen (1931). At the beginning the League had 7000 members, but Nazi persecution reduced its numbers, and in 1938 only 1000 persons were left to reject the oath of allegiance to Hitler. N. preached courageously against Nazi domination of the Church and other policies, and his services had crowded congregations. On July 1, 1937, he was put into the Sachsenhausen concentration camp, but refused to recant or accept release on the condition that he would undertake not to preach any more. In a

secret trial in 1938 before a 'people's court' he was sentenced to seven months' 'fortress' imprisonment (a sort of honourable prison for officers), but after eight months he was released, only to be re-arrested by the Gestapo and kept in further 'protective custody.' There he remained throughout the Second World War. In 1946 he proclaimed Germany's war-guilt at the International Missionary Council in Genova and in 1947 was elected the first bishop of the reformed Evangelical Church of Hesse-Nassau. His works include *Vom U-Boot zur Kanzel* (1934); and *Dass wir an Ihm bleiben* (1935). See H. M. Stückelburger, *Der Kampf der Berkenkenniskirche*, 1945.

Niernsch von Strehlenau, Nikolaus, see LENAU.

Niepce, Joseph Nicéphore (1765–1833). Fr. physicist and an inventor of photography, was b. at Châlon-sur-Saône. From 1795 to 1801 he was administrator of Nice, when he returned to his native place and directed his energies to chemical research with his brother Claude (1763–1828). In 1811 he turned his attention to lithography, in 1827 produced a photograph on a metal plate; in 1829 he joined Daguerre in his work, and after years of experimenting together they discovered the process of chemically amplifying the photographic image.

Nierembergia (named after J. E. Nieremberg), genus of the family Solanaceæ, allied to *Petunia*. There are twenty species native to tropical America, perennial herbs and shrubs, frequently cultivated. They are propagated from cuttings, or by sowing seed in a hotbed during spring and transplanting in May.

Nierstein, vil. of Hesse, Germany, on the Rhine, 8 m. S. of Mainz. Is especially noted for the Niersteiner wines and near by is a sulphur spring. Pop. 4800.

Nietzsche, Friedrich Wilhelm (1844–1900), Ger. philosopher of aristocratic Polish extraction, was b. at Röcken, near Lützen, his father being a clergyman. After a brilliant univ. career at Bonn and Leipzig he was appointed, at the age of twenty-four, prof. of Gk. at Basel. This post he resigned in 1879 owing to ill-health, retiring on a pension of £120. In 1889 he went mad, and, after remaining so for eleven years, he d. at his sister's house in Weimar. To these few biographical details must be added (for it is the key to much in his philosophy) the fact that his life was one long struggle against sickness, neuralgia and insomnia being its princi. manifestations.

N.'s philosophy can be expressed in a few words. He regarded humanity as being composed of two types fundamentally different from each other, the weak and the strong, the stolid and the masterful, the mob and the aristocratic few. In the struggle between these two types each would naturally seek to impose its morality on the other and to deprecate those qualities in its opponent that are dangerous to it. Thus the weak command the qualities of meekness and compassion, extol poverty and renunciation. Because Christianity (which, as N. significantly

points out, arose among the slave pop. of Rome) extolled this slave morality, he was opposed to it and proclaimed himself Antichrist. He would revalue all values in the light of the morality of the strong. And for mankind he held up the ideal of surpassing itself, the need for creating a higher, stronger, and more dominant race, the Superman. These ideals are set forth with much powerful eloquence in his many books, but chiefly in the lyrical and epigrammatical *Thus Spake Zarathustra*.



F. W. NIETZSCHE

A complete ed. of N.'s works in Eng. (18 vols.) has been ed. by Dr. Oscar Levy (1909-12). See *Life* by his sister, E. Förster-Nietzsche, 1895; H. Albert, 1903; D. Halévy, 1909, and 1911; R. Richter, 1922, and G. B. Foster, 1931; also studies by F. C. Schiller, 1913; H. L. Mencken, 1913; G. Brandes, 1914; G. Abraham, 1930; J. Lavrin, 1948; H. A. Reyburn, 1948; and H. Mann (now ed.), 1948. See also O. Levy (ed.), *Thoughts out of Seaside*, 1909; A. R. Orage, *Nietzsche in Outline and Aphorism*; E. Bentley, *The Cult of the Superman*, 1947.

Nieuwburg: 1. Tn. of Lower Saxony, Germany, on the Weser, 30 m. N.W. of Hanover. Pop. 11,100. 2. Tn. in Saxony-Anhalt, Germany, on the Saale, 20 m. from Magdeburg. Pop. 6000.

Nieuwland, Pieter (1764-94), Dutch poet and mathematician, b. near Amsterdam. He became prof. of mathematical and physical science at Leyden. His *Poësies hollandaises* (1788) contain some fine pieces, among which may be mentioned the poem *Orion* and the elegy on

the death of his wife. His scientific works include *Almanach nautique*, with Van Swinden; *Dissertations sur la construction des octans de Hadley* (1788); *Discours sur les moyens d'accélérer l'art nautique* (1789); and *L'Art de la navigation* (1793).

Nieuwpoort (Fr. *Nieuport*), city in the prov. of W. Flanders, Belgium, 21 m. W.S.W. of Bruges. It stands on the R. Yser (q.v.) about 2 m. S. of its mouth and is in the junction of sev. canals. It is one of the less important Belgian seaports, but has a fishing fleet. By opening the sea-locks in Oct. 1914, thus inundating the lower polders as far as Dixmude, the Ger. advance could be stopped at the Yser. During the war the city was completely destroyed and its interesting buildings, the cloth hall, the belfry, and the Gothic church, were lost. Rebuilt, the city suffered again very much in the Second World War. It is engaged in fishing, and there are oyster parks, salt works, and manufs. of ropes, sails, and nets. It has sev. war memorials. Pop. 5100. See C. Wybo, *Nieuport ancien et moderne*, 1904, and C. Loppens, *Nieuport, notices historiques*, 1935.

Nievis, see NEVIS.

Nievre, dept. of Central France, formed mainly out of the old prov. of Nivernais with a part of Orléanais. It is divided into four arronds., Nevers, Château-Chinon, Clamecy, and Cosne. It belongs to the basins of the Loire and Seine, and has an area of 2655 sq. m. The surface is rugged in the E., comprising part of the granitic mts. of the Morvan, of which the highest point within the dept. is Prénéeley (2790 ft.), but in the W., where the calcareous formations predominate, the highest point is 1400 ft. Forests cover large areas, but much land is given over to pasture and the cultivation of forage, the fattening of cattle and the rearing of sheep and horses being important agric. industries. The chief cereals are oats and wheat, but potatoes are largely cultivated. Vines are grown in the valley of the Loire and in the neighbourhood of Clamecy, the white wine of Pouilly being famous. The prin. mineral is coal, which is found in the neighbourhood of Decize, and the chief manufs. are iron and steel at Guérigny, Fourchambault, and Imphy. The cap. is Nevers. Pop. 248,500.

Nieuwe Diep Harbour, see HELDER.

Niffer, see NIPTUR.

Nigde, or Nigde, tn. of Asiatic Turkey in Konia, 68 m. N.N.W. of Adana. Pop. 59,200. There is a vilayet of the same name, pop. 251,800.

Niger, Gaius Pescennius, governor of Syria, was a Rom. of equestrian rank. He was chosen emperor by the troops in A.D. 193 on the death of Commodus; but failing to march on Rome at once, was intercepted by Severus, a rival claimant. Three battles were fought, resulting in the defeat of Pescennius, who fled towards the Euphrates. He was captured and put to death, A.D. 194.

Niger, or Quorra (Kwara, Kowara, etc.) (the name is not derived from the Lat. adjective for 'black,' but from a Libyan

and Sudanese root, meaning 'water' or 'river.' The word was used by Ptolemy in the Gk. form of *Nye*, and is used today by Lake Chad tribes in the form *njer*. See also NIGERIA, important riv. system of W. Equatorial Africa, ranking next in size to the Congo and the Nile. It rises in the country of the Mandingos, about 150 m. from the coast, and flows N. and N.E. towards the Sahara, then S.E. and S., finally entering the bight of Benin in the gulf of Guinea by an enormous delta (14,000 sq. m. in area), which extends nearly 150 m. inland. Its chief stream, the Tembi, is joined by the Tamincou and the Fallico, all rising in the mountainous region of N.E. Sierra Leone. Lower down, at its confluence with the Tankissio, it is called the Babaa or Joliba. At Bammaru in Bambarra it becomes navigable for steamers, and after passing Sunsanding it divides into sev. arms, enclosing extensive ls. From Kabara (port of Timbuctoo) it passes along the desert towards the frontiers of Hausa Land and is called the Kwarwa, Kiora, or Mayo, and further S. the sea or lake of Nupe (Nyffe). The Niger's chief l. trib., the Benue or Chadda (q.v.), joins it opposite Lokoja, and being navigable from Adamawa affords communication with the interior. The Bussa rapids, in which the explorer Mungo Park was drowned (1805), are below the junction of the Sokoto and the Niger, and are more dangerous than those between Ansongo and Say. The chief deltaic branch of the Niger is the Nun (now little used); others are the Forcados, Brass, Bonny, Sombrero, Opo-bo, etc. Total length about 2600 m.; area of basin 600,000 sq. m.

Mangrove forests form the chief vegetation of the remarkable delta region. The Upper Niger was explored by Mungo Park (1795-97 and 1805), the Middle by Barth (1851-54), and the Lower by Clapperton (1826-27) and Lander (1830). Among other explorers are Houst (1896), Lenfant (1903), and Talnot (1904). The riv. is Brit. from its mouth to the end of navigation, above that part it is Fr. See R. and J. Lander, *Journal*, 1833; H. Barth, *Travels and Discoveries in North and Central Africa*, iv.-v., 1857-58; J. Johnston, 'The Niger Delta' in *Proceedings, Royal Geographical Society*, Dec. 1888; J. Thompson, *Mungo Park and the Niger*, 1890; A. Mockler-Ferryman, *Up the Niger*, 1893; J. K. Trotter, *The Niger Sources*, 1898; J. Lenfant, *Le Niger*, . . ., 1903; A. G. Leonard, *The Lower Niger and its Tribes*, 1906; B. Alexander, *From the Niger to the Nile*, I., 1907; M. Delafosse, *Haut Sénégal-Niger*, 1912; P. Germain, *Mungo Park*, 1924; M. Abadie, *Le Colonie du Niger*, 1927; E. P. Stebbing, *The Forests of West Africa and the Sahara*, 1937; and C. Hanin, *Occident noir*, 1947.

Niger Colony, see FRENCH WEST AFRICA.

Nigeria (from very early times the land of the Niger, on the derivation of which name see NIGER, was called Nigris, possibly following Pliny's form *Nigris*. The modern name Nigeria was suggested by Miss Flora Shaw, later Lady Lugard, wife of the master builder of the protec-

torate and adopted by the Imperial Gov. in 1900), a Brit. colony and protectorate of Brit. W. Equatorial Africa, extending between the Lower Niger and Lake Chad. It is situated on the N.E. shore of the gulf of Guinea, and enclosed roughly by parallels of lat. 4° and 14° N. and by meridians of long. 3° and 14° E. It is bounded on the N. and N.W. by the military ter. of the Fr. Sudan, on the E. and S.E. by the Cameroons, on the S. and S.W. by the gulf of Guinea and on the W. by Dahomey. Greatest length from E. to W. is 700 m. and greatest breadth from N. to S., 650 m. The area of Nigeria, including the mandated ter. of the Cameroons (q.v.), is approximately 372,674 sq. m. (S. Provs. and colony, 90,971 sq. m., N. Provs. 281,703 sq. m.). The coloured pop. is estimated at 20,477,000 (N. Provs., 11,886,000, S. Provs., 8,266,000; colony, 325,000), and the number of Europeans on an average is 5900. The territorial divs. of Nigeria are the 'colony of Nigeria,' the 'N. Provs.' and the 'S. Provs.' The N. and S. Provs. were amalgamated in 1914, the colony and protectorate of S. Nigeria and the protectorate of N. Nigeria being formed into the colony and protectorate of Nigeria. The country is usually divided into the delta region (swampy and unhealthy and abounding in mangroves), the forest region (very hilly in parts) and the plateau region in the centre, where the climate is much drier. Tornadoes and cyclones are met with in the N. and N.E. and the harmattan blows from the Sahara. Malaria, leprosy, and ophthalmia are common diseases. The former protectorate of N. Nigeria was constituted (Jan. 1900) over ter. which belonged before to the Royal Niger Company Ltd. (incorporated 1886). It included the old Fulah empire, with its Hausa states, and the ter. of Bornu, Kano, and Sokoto were acquired 1900-3. The N. Provs. are Adamawa, Bauchi, Benue, Bornu, Kebbi, Katsina, Kano, Niger Plateau, Sokoto, Zaria, and Nassarawa. The Middle and Lower Niger and most of its large trib. the Benue, lie in this region. Among the chief tns. of the N. Provs. are Gando, Sokoto, Kano, Bida, Bauchi, Zaria, Ilorin, Yola, and Maifoni. The administrative headquarters of the N. Provs. are at Kaduna. The former protectorate of S. Nigeria contained three provs.—W. or Lagos (including the colony), Central Prov., and E. Prov., and occupied the whole of the delta region. In 1906 the old colony and protectorate of Lagos were united to the protectorate of S. Nigeria, with Lagos as the seat of government. Later, as seen above, the N. Provs. were amalgamated with the S. These latter are Abeokuta, Benin, Calabar, Camerons, Ijebu, Oyo, Ogoja, Onobo, Onitsha, Owerri, and Warri. The chief tns. are Lagos, Burutu, Forcados, Degema, Bonny, Opobo, Ibadan (q.v.) (largest native city in Africa), Calabar, Badagry, Jebu Ode, Ondo, Shaki, Benin City, Ouitsha, Port Harcourt, Abeokuta, and Brass.

Administration.—In 1944 the governor, Sir Arthur (later Lord) Richards sub-

mitted proposals for the revision of the constitution to the secretary of state (see Cind. 6599), the prin. features of which were a legislative council for the whole of Nigeria; regional councils for each of the provs., consisting of houses of assembly with the addition in the N. Provs. of a house of chiefs; direct representation of the people via the native authorities and houses of assembly on the legislative council; and an African majority both in the houses of assembly and the legislative council. These proposals which may be regarded as the logical outcome of the development of 'indirect rule,' were accepted by the imperial gov. and were brought into effect in 1946. There is an executive council, whose official members are also members of the legislative council. The legislative council consists of the governor as president, twelve ex-officio members, three nominated unofficial members, eighteen unofficial members nominated by the unofficial members of the regional houses of assembly and the N. house of chiefs, six unofficial members nominated by the governor, and four elected members. Conformably with the Richards proposals there are houses of assembly for the N., W., and E. Provs., each of which has an unofficial majority, and a house of chiefs for the N. Provs.

The Provs. are each administered by a chief commissioner, with headquarters at Kaduna, Enugu, and Ibadan; the colony is administered by a commissioner. The protectorate is divided into twenty-three provs., each under a resident. Nigeria is usually considered to offer the most typical illustration of the characteristic features of 'indirect rule' (*q.v.*) or, in other words, the system by which the trustee power recognises African societies and assists them to adapt themselves to the functions of local government. Historically, it was after the conquest of the Bida emirate that Sir George Goldie, regarded as the founder of Nigeria, laid down the principle that the Royal Niger Company should as far as possible 'rule indirectly through feudatory princes' on the model adopted in India in dealing with the Indian states. Lord Lugard, a famous colonial governor, had experience of the Indian system and as governor in N. Nigeria he encountered circumstances unusually favourable to the adoption of the principle of ruling through the chiefs, for in the N. emirates the Fulani conquerors had estab. organisations which had many of the features characteristic of the Moslem kingdoms in N. Africa and Asia. Lord Hailey, a distinguished critic of colonial administration, has indicated that the study of the early stage of native administration in Nigeria is of outstanding interest since it 'reflects the application of a deliberate policy, put into operation from the first and steadily developed to meet the expanding needs of civilised government' (*An African Survey*). There were, in the N. Provs. in 1938 approximately 80 chiefs and 130 councils, including chiefs in council, as native authorities, with 41 and 451 native authorities subordinate to them respec-

tively. In S. Nigeria there were recognised as native authorities 29 chiefs, 139 chiefs in council, 360 clan and group councils, some with numerous subordinate native authorities, 150 vil. councils and 29 native courts. The native treasury in Nigeria is regarded as an essential feature of the system of native administration; for it not only preserves the tradition under which the native authorities held the proceeds of tribute or services in trust for the community, but provides a training in responsibility, and also establishes a close contact between the native authority and those on whose behalf expenditure is incurred. Equally essential to native administration as practised in Nigeria is the native court. These are true native tribunals and only in exceptional cases do Brit. administrative officers take part in their proceedings; and they are manned by one or more chiefs or other persons or a combination of these. There is a whole hierarchy of courts up to native courts of appeal which hear appeals from courts of first instance.

The emirs of N. Nigeria mostly stem from the cattle-owning, nomadic Fulani invaders. The degree of personal autocracy exercised by each varies according to custom and temperament. Some are progressive, a few openly reactionary. As a class they possess political instinct, and the development of a big international air junction round Kano put them in touch during the Second World War with world affairs. They are fully conscious of the need for the N. to overcome S. opposition to their rule if their traditional way of life is to survive at all. In domestic life they are frugal. Inhabiting rambling, castellated mud palaces, they maintain large retinues but do not go in for luxuries in the western sense. A defect of the administration is over-centralisation, but this is being remedied. The headquarters secretariat of an emir is the prin. repository of power. The secretariat is run entirely by natives, with Brit. advisers holding a watching brief. It deals with almost every branch of administration, including revenue and police. The chief *alkali* still presides over his court sitting cross-legged on a high divan in a towering white turban. In the technical depts. there is a sprinkling of Christians from the S., wearing striped shirts and grey flannel trousers. A feature in the administration is the growing power of the young *mulams*, the educated few who approximate to the Middle-E. *effendi*. Still mostly of chiefs' families, their ranks are now open through the schools to the peasantry. On them the future must depend. The part of the Brit. administrative officers in this organisation is concentrated on advising, watching, and hearing complaints. Their greatest power is probably the granting or withholding of approval in important appointments to office. They exist in a proportion of not more than one to 300,000 of pop. A higher proportion is unnecessary in view of the fact that the native administration is reasonably efficient. In

technical services direct intervention is more common. Downwards the chain of command extends through the hierarchy of dist. and vil. headmen, now being strengthened by the addition of councils where these do not already exist.

Production.—There are great agric. resources in the N. Provs. Crops for home consumption include maize, yams, cassava, sweet potatoes, sugar-cane, Guinea corn (or sorghum), ground-nuts, rice, millet, tobacco, plantains, bananas, and beans of various kinds. The outstanding agric. products for export are palm oil, palm kernels, ground-nuts, and cocoa. Ground-nuts and palm products are used for cattle-cake, soap, margarine, and a number of other important commodities. Other products for export are cotton lint (but cotton is grown mainly for the local industry of hand spinning and weaving) and mahogany. Wheat is grown to a small extent, large herds of cattle, sheep, and goats are raised in the N. Provs., and in the extreme N. ostriches and camels are bred. Horses and donkeys are bred and in common use in the N. part of the portectorate. Tin is the chief mineral produced. Tin ore has been worked and smelted by natives during the last hundred years, the present Seriki (Chief) Liruehn-Delima being the grandson of the native who, historically, first discovered and worked it. There is, however, strong evidence to show that some former race knew of its existence. Beads that could only have been made by man may be seen that have been found in the deep detrital deposits, and they bear no resemblance to any modern ornaments made by tin workers, and, further, the depth at which they have been found precludes a modern origin. The prin. tin-fields are situated on the W. boundary in the Bauchi Prov. and in the provs. of Nassarawa, Zaria, and Kano adjoining the boundary. Tin is also known to exist in the provs. of Ilorin, Calabar, and Yola, but as yet has not been found in payable quantities. The peak output of 15,335 tons in 1929 made Nigeria the fourth tin-producing area of the world; but in 1933 the international restriction scheme reduced production to 4956 tons; in 1936, at 13,432 tons it represented the second largest output in the Brit. Empire, with a value of £2,011,000. 14,090 tons were exported in 1947. The second important mineral of Nigeria is gold, but development is still confined to the alluvial stage. Deposits of lignite and coal have been discovered near Asabe and Udi in the S. Provs. A colliery was opened by the gov. in 1915 at Enugu, the coal won being used by gov. depts. or sold to the public. This colliery is capable of producing 400,000 tons a year, which exceeds the local demand, and further prospecting for coal is therefore prohibited (1939). Coal output in 1947 was 581,528 tons. There are salt and soda deposits in Bornu Prov. Iron ore and silver are also found. In 1936 Nigeria exported over 500 tons of columbite and is said to be the world's chief source of supply. Other products are cotton, ivory,

drugs, capsicum, gums, balsams, indigo, and hides. Citrons, limes, oranges, date-palms, pomegranates, mangoes, and other fruits flourish. The Niger Company Ltd. carry on much of the trading, banking, and mining operations of the N. Provs. Mining rights are vested in the gov., but under an agreement with the Royal Niger Company at the date of the revocation of the charter, the company receives half the gross profits from royalties on minerals for a period of ninety-nine years as from 1900. Three new marketing boards for ground-nuts, palm oil, and cotton, on the model of the Cocoa Marketing Board (which has been functioning successfully for some years) were set up in April, 1949. Their main object is to buy from local producers at controlled prices and sell abroad at world prices, thereby creating funds for the benefit of the industry and the producer.

Education.—See below under *Religion and Education.*

Exports and Industries.—The chief native industries are cloth and mat-weaving, bead work, brick-making, and canoe-binding. The prin. exports (*see also above*) are palm kernels, palm oil, tin, hides and skins, ground-nuts, cotton lint, cocoas, mahogany, and shea produce. Amongst minor products exported from the colony are ivory, ebony, copra, coffee, gutta-percha, beeswax, silk, gums, beni-seed, plassava fibre, capiscums, ginger, and ostrich feathers. Exports in 1947 were £38,380,076 (over £36,000,000 to the United Kingdom) and imports were £39,421,512 (over £15,000,000 from the United Kingdom). The revenue for 1947-48 was £18,404,132; expenditure, £17,185,940. The ports served by ocean steamers are Lagos, Forcados, Burutu, Warri, Sapele, Koko Tn., Skassa, Bonny, Port Harcourt, Degema, Opobo, Calabar, Victoria, and Tiko.

Fauna and Flora.—The fauna and flora of Nigeria are interesting. Lions, leopards, elephants, giraffes, a kind of buffalo, hyenas, antelopes and gazelles, camels, monkeys, and snakes are found. The rives. contain numerous varieties of fish, while the crocodile, the rhinoceros, and the hippopotamus are also common. The tsetse-fly and mosquitoes infest the coast dists. and all the delta region. The birds include ostriches, bustards, birds of prey (such as vultures, kites, and hawks), snipes, quails, partridges, ducks, widgeon, and teal, and many varieties of paroquets, pigeons, geese, etc. Among the chief trees are different kinds of palm (notably the oil-palm, *Elaeis guineensis*; the date-palm, *Phoenix dactylifera*; and the doum-palm, *Hyparrhenia thebaica*); the gambier, the baobab, shea-butter and locust trees, and the tamarind. In the drier regions mimosa and acacia bloom freely. Mangroves are confined to the swampy coast dist. and form its peculiar vegetation.

Tribes.—The vast number of tribes in Nigeria precludes any detailed account, but a few of them may be mentioned. Among the coast tribes are the Jekri, Ijios, Ibos, and Aros; to the S.E. round Calabar dwell the Efiks, Ibibios, and Kwas. The

Hausas and Fulani of the N. are much higher races than these coast-dwellers. Other tribes are the Yoraghums, Munshi, Okpotos, Berberi or Kanuri, and Yorubas.

Communications.—The W. div. of the Nigerian Railway (3 ft. 6 in. gauge) runs from Lagos through Abeokuta, Ibadan, Kaduna, and Zaria to Kano (705 m.). The main line from Kano has been extended to N'Guru (Borku). There are also four branch lines, one from Minna to Baro on the Niger (111 m.), its junction to Idogo (27 m.), Zaria to Kaura Namoda (137 m.), and Zaria to Jos (133 m. of 2 ft. 6 in. gauge track). Port Harcourt is linked with Enugu by a 3 ft. 6 in. gauge line, this line being generally known as the Eastern Railway. It runs through a rice oil-palm belt, and taps the coalfield at Enugu. The line is 593 m. in length and is an alternative outlet for the tin ore and agric. produce of the N. The gov. has constructed a very large number of roads, many of which are suitable for motor traffic. The rvs. Niger and Benue are in themselves great natural highways, and in the S. there are numerous other navigable waterways which provide means of communication and transport. There is a wireless station at Lagos under the control of the Eastern Telegraph Company for ship to shore communication and a number of Post Office wireless stations for internal communications. Direction finders have been installed at Lagos and Kano. There are sixteen aerodromes.

Religion and Education.—Mohammedanism is widely diffused in the N. Provs., notably among the Fulani and Hausa tribes who are of very long-standing historical antecedents. Paganism prevails in some parts. Protestant and Catholic missions have industrial schools at many stations. Of the 20,000,000 inhab. 8,500,000 are Muslims, 10,500,000 pagans, and 1,000,000 Christians. The fewness of the Christians is surprising in view of the fact that the W. coast of Africa has been in close contact with Europe for three centuries. But Christian missionary effort did not make any great headway until the beginning of the present century. It has met with conspicuous success in S. Nigeria where, unopposed by Mohammedanism, it has gone hand in hand with European education. Elsewhere Christianity suffers from a number of disabilities, compared with Islam. It is spread by Europeans, whose culture is poles apart from that of the African; Islam is spread among blacks by blacks. Christianity is presented in multitudinous forms; Islam is practically free from sectarianism and indeed constitutes one huge brotherhood. The prin. schools are at Kano, which is a Mohammedan centre, and the natives are educated on the lines of the system prevailing in the Egyptian Sudan. Until recent years education was mainly primary, but proposals made in 1929 led to the reorganization of the system into primary and middle schools, the latter giving a training of various types, which includes workshop practice and agric. instruction, closely

connected with the teaching of biology. In the N. Provs. education in the Mohammedan emirates is chiefly in the hands of the gov., while the missions concentrate on the pagans. There are in the N. about 37,000 Koran schools with over 220,000 pupils, 530 primary and middle schools with 25,000 pupils, 4 training centres, and 1 college. The Katsina College gives preliminary instruction in medicine and agriculture. In the S. Provs. the great majority of the people are pagan, but both Christianity and Islam are rapidly gaining ground. The lower stages of education are given in mission schools conducted by the African Churches. More advanced education is given in some



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IN THE NATIVE QUARTER

mission and gov. institutions. In 1942 there were 3500 primary and middle schools with 270,000 pupils, and over a score of training institutions. At Yaba, near Lagos, there is a higher college, one of the chief institutions for post-secondary education in Brit. African dependencies. The college gives courses in medicine, agriculture, engineering, and surveying. In 1947 an autonomous Univ. College was set up at Ibadan, and it is proposed to raise its status to that of a univ. of W. Africa, which will confer its own degrees.

Labour Services.—The first labour code was enacted in 1929, a section of the secretariat dealing with affairs under the ordinance. In 1942 the Labour Dept. was formed as a separate gov. dept. Its present activities cover industrial relations, wages inspectorate, inquiries into the cost of living, and advice to trade unions. There are also advisory boards for various trades who inquire into

conditions and wages. Adult and juvenile employment exchanges were opened in Lagos in 1943. Regional headquarters were estab. in the N., W., and E. Provs. and in the colony of Lagos, in order that the chief commissioner and the commissioner of the colony may get the advice of labour officers and experts on labour problems. The ordinance of 1929 was replaced by a more comprehensive ordinance embodying those conventions of the International Labour Office which the Brit. Gov. has agreed to observe in relation to the colonies. This new code came into existence in April 1946. Ninety-six African trade unions had been registered under the Trade Unions Ordinance by the end of 1945. A Nigerian Trades Union Congress came into being in 1943.

Ten-year Plan of Development and Welfare.—Under the 1946 ten-year development scheme extensive plans were elaborated for improvement in agriculture, education, and health, communications, water supplies, etc. It was proposed to spend £55,000,000, and towards this a contribution of £23,000,000 was made by the Brit. Gov. under the Colonial Development and Welfare Act (*q.v.*). The remaining sum of approximately £32,000,000 was to be found in about equal proportions from Nigerian revenue and from loans to be raised by the Nigerian Gov. The provision of adequate water supplies was of such importance that most of the cost of the rural supplies was to be met by development funds. The urb. scheme provided for all tns. with a pop. of over 5,000 to have a piped and treated supply. As regards health services, the aim was to provide one hospital bed for every 2000 of pop., the existing ration being only one in 5000 (the rate in England is one in 350). Rural health centres, mobile clinics, and epidemic units were to be estab. For lepers, hospitals and segregation vls. were built as the centres of out-station work.

In the sphere of education it was recognised that all existing facilities should be much expanded at all levels, but it was not possible to expand elementary education until teachers were available, and these could only be forthcoming from extended secondary education. Meanwhile, in the N. Prov., a women teacher's training centre was estab. at Kano and a secondary school at Zaria. Technical education is backward and trades centres were set up for each of the four administrative regions, where in addition to general education a five-year course provide for instruction in the building and mechanical trades. Near Lagos, a technical institute capable of taking 250 students is being estab. The extension of roads and communications generally applied chiefly to the S. parts of the country and the mileage of feeder as against main roads was to be almost doubled. In this connection most large tns. issued tn.-planning ordinances in an attempt to prevent ribbon development and the ruin of country small holders consequent on the disturbance of balance

between urb. and rural pop. From a long-term point of view the development of Nigeria's natural resources is the most far-reaching aspect of the ten-year plan, and the maintenance cost alone for the new services to be provided will impose a heavy charge on the ann. budget of the colony. Experimental farms were estab. in all parts to improve the quality and strain of indigenous crops. In the N. Provs. experiments in rice-growing under methods of controlled irrigation and of the mechanised production of ground-nuts were pursued. Organised research was being carried out on the problem of *tsutsi* (*q.v.*) infection. World shortages, political unrest, and rising prices had a considerable retarding effect on the schedule prepared when the whole plan was first inaugurated, and delays and 'bottle-necks' in the import of essential materials were an added complication. These delays particularly affected the supply of heavy machinery for the provision of water supplies and the construction of roads. It is a valid criticism of the development plan that to a large number of the people living in the remote regions it appeared to be a mere administrative action which would leave them unaffected. The Nigerian Local Development Board, however, has powers to allocate loans to native administrations, whether for development of townships, improvement of farms, building of dispensaries, etc.

History.—The N. part of Nigeria, although vaguely known to Arab geographers of the fourteenth century who were acquainted with the Negro kingdoms of the W. Sudan, remained unknown to Europe until, towards the end of the eighteenth century and in the first half of the nineteenth century, explorations by Mungo Park, Clapperton, the Landers, Barth, and others revealed the true course of the Niger and the existence of organised states of the interior. These discoveries led to attempts to open the country to overseas commerce, and, despite very heavy mortality in the early years, trading posts were estab. on the banks of the Niger and the Benue. When the interior of Nigeria first became known to Europeans, the open country had been for some time the home of the Negroid and Berber peoples, who had adopted the Muslim religion and formed powerful and comparatively civilised states. In the forest and mt. country, on the other hand, there dwelt many Negro tribes, the people of which were rude savages, addicted to cannibalism and human sacrifice. Of the origin of the Yorubas, numerically the most important tribe, who now occupy the country between the Lagos lagoon on the S. and the Niger on the N. and are the predominant race throughout the provs. of Abokouta, Ilebu, Ondo, and Oyo, there is no definite knowledge. A tradition that they came from Egypt is suggested by certain carved stones found at Ife and the manner in which the dead are bound for burial. The cause, however, of their estab. in the W. of Africa was, it is generally stated, in consequence of their

being driven by Yaa-rooba, son of Kahtan, out of Arabia to the W. coast between Ethiopia and Egypt whence they advanced into the interior of Africa until they reached Yarba. On account of the mutual distrust of the Yoruba chiefs, and the consequent weakness of the central authority, the Fulani were able to subdue a Yoruba pop. and to set up a kingdom in one of the best Yoruba provs. When, through these mutual jealousies, the Alafin, ruler of Oyo, was left with little but his cap., the Fulani from Ilorin came in and sacked the tn. Soon afterwards, the emir of Ilorin summoned the Alafin to Ilorin and compelled him to accept the doctrines of Islam, whereupon the Yoruba people resolved to drive out the Fulani and thereby avenge the insult to their titular head. The Fulani, however, inflicted on their forces a crushing defeat; Oyo was deserted, and the people fled before the victorious Fulani, who overran the country as far S. as Abeokuta.

The estab. of the early Hausa states must have taken place at a very remote era but, owing to the systematic destruction of written records by their Fulani conquerors, we have little documentary evidence of the early hist. of the Hausas, who to-day are spread over a large area of N. Nigeria, especially in the provs. of Sokoto, Kano, Zaria, and Bauchi. Before the spread of the Muslim creed the Hausas were pagans, but the new religion penetrated the country in the course of the thirteenth century and profoundly affected both the religious and social life of the Hausas. A form of government grew up based on Islamism, with a well-organised fiscal system and judiciary, and each state was ruled by a king in a walled cap., to which people could flee from invaders. Though each Hausa state was independent, they seem to have been joined together at times in a loose confederation for purposes of defence. From time to time Bornu armies overran Hausaland, while about the year 1513 Askia the great king of Songhay (people of the Middle Niger) conquered Katsina, Zaria, and Kano, and made them provs. of his empire, but later the Hausa states regained their power. Hausaland was often distracted by civil wars for the next century and a half but, by the middle of the eighteenth century, Gobir became the paramount power in Hausaland, which was now under pagan rulers again.

Islamism was at its lowest ebb when the movement commenced which was⁸ only to end with the definitive estab. of a Fulani empire over the whole of the land. Nothing definite is known of the Fulani (also called Fulas, Fulahs, Peulhs, and Pulo), and they have been derived by various ethnologists from Phoenician, Indian, Jewish, and Malayan stock, but the most widely accepted theory is that they originated from Upper Egypt and migrated via the Atlantic coast into Nigeria, their superior intelligence soon giving them a permanent footing in the country. For centuries, however, the Fulani remained in Hausaland as a more or less subject race, but in 1802 Othman

Fodio, a Fulani sheikh whose reputation for sanctity gave him great influence over even the pagan king of Gobir, quarrelled with the king, on behalf of a party of Moslems who were being driven into captivity. When a general massacre of the Fulani was threatened, Othman raised the banner of revolt and defeated the king in a decisive battle. The heads of the various Fulani clans now flocked to Othman's banner, recognising him as the Sarkin Musulmi (commander of the faithful). The jihad or holy war had now commenced, nominally only against pagans, but actually also against all tepid followers of Allah and His Prophet. Thus, although Bornu was a Muslim country, it was attacked and conquered (1808) and only regained its independence by the military skill of a famous sheikh named El Kanemi. The jihad was not at first entirely successful but it was sufficiently so for Othman to entrust the administration to his brother Abdullahi and his son Bello, he himself resuming study and preaching until his death in 1817. Bello's reign was troubled one, there being continual wars against tribes which refused to submit to Fulani hegemony, but, despite these wars, Bello found time to study and, like his father, wrote sev. works on hist., theology, and geography. He was visited by Clapperton at Wurno (1824) and sent a cordial message by Clapperton to William IV. The Fulani rulers certainly administered the Hausaland with ability and justice, and the fact that they were able to maintain their rule for a hundred years, a comparatively small number of aliens governing a numerous subject people, is evidence of their marked superiority among the W. African tribes. But as Othman's original famous 'flag-bearers' in the jihad passed away, corruption crept in, the emirs slackened in their administration and lapsed into the habits of the pagans. Thus it was a diminished kingdom, from which the glory had departed, when the Brit. arrived at the end of the nineteenth century.

Lagos was bought in 1861 from a native king, in 1866 placed by letters patent under the gov. of Sierra Leone and, later, administered as part of the Gold Coast colony until 1886, when a separate colony and protectorate of Lagos was founded. It is true that other European nationals had set up trading posts on the Niger as early as the seventeenth century, but they were not interested in political development and were concerned exclusively with the slave-trade, and indeed it was only after the abolition of this trade in the early years of last century that there was any appreciable advance in the commerce in commodities. Even so, Lagos had been bought chiefly to prevent its continued use as a slave market. Prior to the period commonly known as the 'scramble for Africa,' Brit. merchants came together in mutual defence against Fr. competition, under the leadership of Sir George Goldie (the 'founder of Nigeria') as the United African Company, being granted a Royal Charter (1873). In

1885 the Brit. claim to a protectorate over Nigeria was recognised by the Berlin Conference, and that part of the country which was not included within the Lagos ter. or the sphere of the chartered company was placed under Foreign Office administration as the 'Oll Rvs. Protectorate,' later named the 'Niger Coast Protectorate.' By 1900 the chartered company had passed its period of usefulness and its charter was revoked. The N. part of its ter. became the N. Nigeria Protectorate and the S. was combined with the Niger Coast Protectorate as the protectorate of S. Nigeria, and both were placed under the Colonial Office. In 1906 the colony of Lagos and its protected ter. were combined with the protectorate of S. Nigeria and designated the colony and protectorate of S. Nigeria, with Lagos as the seat of government, and finally, in 1914, the N. and S. protectorates were amalgamated to form the present colony and protectorate of Nigeria. Until 1900 the chartered company had been responsible for both the civil administration and commercial development, but it never succeeded in extending its administration over the whole of Nigeria though its influence was felt along the main trade routes on the rvs. Even after the transfer of government to the Crown much remained to be done in the pacification of the country, a work which owed much to Lord Lugard and the late Sir Hugh Clifford; and it was not until after 1900 that the phase of internal economic development could begin. Yet, as Lord Hailey justly observes, 'the fact remains that for a capital outlay of about £1,000,000 the largest British Colony in Africa was added to the Crown.' See also BENIN; BENUE; BORNU; FULAHS; HAUSAS; IBU; KANO; LAGOS; NIGER; NUPE; SOKOTO.

See J. Scott Keltie, *The Partition of Africa, 1885*; Paper relating to the Royal Niger Company, London, 1899; Sir H. Johnston, *The Colonisation of Africa, 1899*; A. F. Calvert, *Nigeria and its Tinf-fields, 1910*; E. D. Morel, *Nigeria, 1911*; Capt. C. W. J. Orr, *The Making of Northern Nigeria, 1911*; Sir F. D. Lugard, *Report on the Amalgamation of Northern and Southern Nigeria, and Administration, 1912-19*, and *The Dual Mandate in British Tropical Africa, 1922*; A. J. N. Tremearne, *Tailed Head-Hunters of Nigeria (Hausa and other tribes), 1912*; A. Schultze, *The Sultanate of Bornu (trans. by P. A. Benton), 1914*; I. Vischer, *Croquis et Souvenirs de la Nigérie du Nord, 1917*; A. H. Unwin, *West African Forests and Forestry, 1920*; A. Buchanan, *Out of the World North of Nigeria, 1921*; S. Johnson (an African), *History of the Yorubas, 1921*; H. C. Hall, *Barrack and Bush in Nigeria, 1924*; *The Times Trade Supplement, British West Africa Section, March 21, 1925*; A. C. Hastings, *Nigerian Days, 1926*; C. M. Meek, *The Northern Tribes of Nigeria, 1931*, and *Law and Authority in a Nigerian Tribe (deals with the Ibo), 1937*; W. G. A. Ormsby-Gore, *Report on a Visit to West Africa (Cmd.*

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Niger Territory (Fr.), see NIGER; SENEGAL, UPPER.

Night-blindness. see NYCTALOPIA.

Night-blooming or Noctiflorous Plants, are plants which have adapted themselves so as to gain the fertilising services of moths and a few other nocturnal insects. All of them are strongly scented and most very fragrant, and on that account are valued in the garden. Most of these plants bear showy white flowers, and those that are tinted yellow, pink, or blue have their texture such that they are conspicuous in the lighter hours of the summer night. The commonest instance amongst wild plants is the white bladder campion, a member of a genus that exhibits a variety of devices for securing fertilisation by insects. Most of the tobacco plants (*Nicotiana*) close their flowers and allow them to droop in the daytime, raising them in the evening, opening out and emitting a penetrating but very sweet odour. In some plants the flowers last for a number of nights, but others open and fall in one night. Other familiar garden noctiflora are the jasmines, the tree of sadness, the marvel of Peru, the night-blooming cactus, the night-scented stock, dame's violet, and the evening primrose, none of which are natives of Britain.

Nighthawk, another name for the Brit. nightjar. Also the best-known species (*Chordiles virginianus* or *C. popetue*) of Chordiles, a genus *Caprimulgus* (goat-sucker). It is the nighthawk of N. America and has a wide range from Canada to Brazil. See GOATSUCKER.

Night Heron, or *Nycticorax*, genus of birds of the family Ardeidae of very wide distribution. They are most active at night. Of about nine species, *N. griseus* alone visits Britain. The bird is 23 in. long, and its plumage is beautifully coloured, the back being greenish-olive

and the breast wine colour; long white plumes are borne on the head.

Nightingale, Florence (1820-1910), the reformer of hospital nursing, b. at Florence. While quite young, she did much philanthropic and social work in England, and in 1844 visited many hospitals and reformatory schools in Europe. In 1851 she trained as a nurse at an institution of the Protestant Deaconesses at Kaiserwerth, on the Rhine, and on her return to England devoted herself to the Governesses' Sanatorium in connection with the London Institute. At the beginning of the Crimean war the wounded soldiers suffered so terribly from the inefficiency of the nursing dept. that Florence N. volunteered her services and sailed with thirty-four nurses in 1854. Her self-sacrificing services to the wounded made her name famous throughout Europe. She wrote sev. pamphlets on nursing and hospitals, and a fund, the interest on which amounts to about £1600 per annum, was raised in 1857 for the purpose of training nurses, now carried out at St. Thomas's and King's College Hospitals. The newly available Verney-Nightingale papers afford interesting details of her relationships with Benjamin Jowett (who wanted to marry her), Richard Monckton Milnes (also a great admirer), Sidney Herbert, and the poet Arthur Hugh Clough, both also intimate friends. See lives by Miss Tooley, 1904; Sir E. T. Cook, 1913; R. Nash and A. Short, 1925; G. C. Willis, 1931; and C. Woodham-Smith, 1949; also L. Strachey, *Eminent Victorians*, 1918.

Nightingale (*Luscinia megarhynca*), most famous of the warblers, or indeed of any song-birds. The male bird arrives from N. Africa, in the middle of April, a few days before the female, going almost invariably to the woods and copses which have always been the haunts of its species; but the distribution is very local, being confined to the S. and Midland cos., though sometimes found in the W. The N.'s song on a calm night in May or June has a perfect setting; but it is impossible to exaggerate the beauty of its song, which is unique in its variety and sustained melody. Contrary to the popular idea, the song can be heard by day as well as at night-time. The nest is made often on the ground, of dry grass and leaves, and in it are laid four to six olive-green eggs. The male's song continues until the young are hatched. The female is slightly smaller than the male, but exhibits no definite distinction of plumage. The upper parts are chestnut-brown; the long rounded tail is reddish-brown, and the breast is dull greyish-white, tinting to brown. The food is mainly composed of caterpillars, other insects, and small worms; but fruit is sometimes eaten. The winter migration begins as early as July, and is completed before the end of Aug. Ns. are sometimes kept in captivity, but need much careful management. *L. philomela*, the thrush N. of E. Europe, is a louder but not such a sweet songster. The Persian N. (*L. hafzii*), is said to be the bulbul of the poets.

Nightjar, see GOATSUCKER.

Nightmare, see under DREAMS; FREUD, SIGMUND.

Nightshade, name given especially to a number of plants of the family Solanaceae. The deadly N. (*Atropa belladonna*) is the most dangerous of Brit. poisonous plants. Every part of the plant has the poisonous principle, atropin (q.v.). The berries are large and black, and except for the persistent calyx, resemble cherries; they are often mistaken for an edible fruit by children, with fatal results. It is a stout, erect plant, 3 or 4 ft. tall, with large ovate leaves and solitary drooping bell-shaped flowers, purple in colour; happily it is not common. Frequently



DEADLY NIGHTSHADE

mistaken for it are the woody N., or bittersweet (*Solanum dulcamara*), a common twining plant in hedges with drooping clusters of purple flowers with yellow anthers, and the black N. (*S. nigrum*), a small upright plant with drooping white flowers with yellow anthers. These also are poisonous, and frequently cause loss of livestock. Enchanter's N. is *Circeea lutetiae* (family Onagraceae).

Nigra, Constantino, Count (1827-1907). It. diplomatist, who carried on the traditions of Cavour for more than forty years, was b. at Castelnuovo, Turin, Italy, and studied law at the Turin Univ. In 1851 he entered the diplomatic service and became secretary to Cavour. He was for many years minister plenipotentiary in Paris, then ambas. in St. Petersburg (1876), London (1882), and Vienna (1885). He ed. popular It. songs, and the correspondence of Cavour and comtesse de Circourt.

Nigri Sembilan, see NEGRI SEMBILAN.
Nigrity, see NIGERIA; SUDAN.

Nihilism (Lat. *nihil*, nothing) as a philosophic term dates from the twelfth century, and may be said to signify that sceptical attitude of mind which denies everything, even existence. In more modern times, however, N. came to stand for an amorphous body of social and political discontent which manifested itself

among the Russian educated classes. Its currency in Russian intellectual circles owed much to Turgenev's famous novel, *Fathers and Sons*, when the chief protagonist of the creed recognises no authority, doubts every general principle and value, and asserts the freedom of the sovereign individual. It was essentially a philosophical and literary school without any political action of its own. However, from the fact that in so far as N. was given a political direction it aimed at a reconstruction of society on a communistic basis, and as, in order to attain that end, Nihilists did not scruple to use the most violent means (their most prominent victim was the Tsar Alexander II., who was assassinated by bombs on March 1st, 1881), N., in the popular mind, became a synonym for anarchism (q.v.). But the great bulk of Nihilists in Russia took no part whatever in the political struggle, and were content to devote their energies to such matters as education, the raising of the status of women, etc., and to making known their ideals through the channels of literature and art. During the last decade or two prior to the First World War, the term N. became more and more obsolescent, for the politically minded reformers had become identified with definite political creeds and parties. See also RUSSIA. History. See J. B. Hopkins, *Nihilism*, 1881; K. Oldenburg, *Der russischer Nihilismus von seinen Anfängen bis zur Gegenwart*, 1888; Prince P. Kropotkin, *Memoirs of a Revolutionist*, 1899, and *The Terror in Russia*, 1911; H. E. Read, *The Philosophy of Anarchism*, 1940; E. von Schenck, *Europa vor der Deutschen Frage*, 1946; and A. Weber (trans. by R. F. C. Hull), *Farewell to European History; or, the Conquest of Nihilism*, 1917.

Niigata, open port of Hondo, Japan, 160 m. N.W. of Tokio. Tea is grown throughout the dist., and there is trade with Siberian ports. The production of pétroleum has been developed, and there is a large manuf. of lacquer-ware. Pop. 150,900.

Níjar, tn. of Spain in the prov. of Almeria, on the R. Artal, about 6 m. from its mouth. Wheat, esparto, fruit, and olives are grown, and lead, iron, and manganese are obtained in the dist. Pop. 13,000.

Nijinsky, Vaslav (b. 1890), Russian ballet dancer and choreographer. His family, of Polish origin, had been dancers for many generations. He was b. at Kiev and at the age of ten entered the Imperial School of Ballet as a student under Nicolai Legat. His extraordinary talent soon became evident, and in May 1908 he graduated as a member of the Imperial Ballet, making his début at the Mariinsky Theatre in the ballet of Mozart's *Don Giovanni*. Two years later he resigned because, it is believed, the propriety of his costume in *Giselle* was questioned. By this time, however, he had won a European reputation with his creation of the parts, among others, of the Egyptian slave in Bakst's *Scheherazade* and of Harlequin in Fokine's *Carnaval* during

the seasons of Russian ballet organised in Paris by Diaghilev in 1909 and 1910. Early in 1911 he left Russia with the independent company which Diaghilev formed with headquarters in Monte Carlo. During the seasons held there and at Paris, Rome, Berlin, and London over the next two years N. added to his triumphs—particularly in Fokine's ballets, *Le Spectre de la Rose* and *Petrouchka*, in which there was scope not only for N.'s genius as a dancer but also his great dramatic ability. In 1913 N. succeeded Fokine as *maitre de ballet*, and in *L'après-midi d'un faune*, *Les Jeux*, and *Le Sacre du printemps* he created a new non-classical style of dancing, violently controversial at the time. In Aug. of that year he went to S. America with the Ballets-Russes and on arrival at Buenos Aires he married Romola de Pulszky, a member of the company, the daughter of an aristocratic Hungarian family. The marriage caused a break with Diaghilev, and N. endeavoured to maintain a London season with his own company. He was entirely unsuited to the administrative work involved and his health broke down. On the outbreak of the First World War he, his wife, and daughter Kyra were interned in Hungary, but in 1915 he was allowed to go to the U.S.A. where he again joined the Ballets-Russes. His new ballet *Tyl Eulenspiegel* to music by Strauss was produced in New York in 1916 but was ineffectual. The Amer. tour was followed by a short season in Madrid and Barcelona at the invitation of Diaghilev. A.S. Amer. tour undertaken by N. in the summer of 1917 proved a failure and was the end of his association with the Ballets-Russes. He retired to St. Moritz. His mental instability, noticeable even in the earlier years devoted to his art almost to the exclusion of normal adult responsibility, now became more evident. In 1918 he was pronounced insane and his career ended. He was the greatest of male dancers, the role of which he revolutionised. His technique, interpretation, and characterisation amounted to genius, combined with a wonderful lightness of movement. It is said of him that he defied the law of gravity, appearing to descend through the air more slowly than he rose. See also BALLET. See C. W. Beaumont, *Nijinsky*, 1932, and Itonola Nijinsky, *Nijinsky*, 1933.

Nijmegen, Nimeguen, or Nymwegen, tn. in the prov. of Gelderland, Holland, on the R. Waal. It was formerly the residence of the Carolingian emperors, and the beautiful park called the Valkhof is built on the site of the old palace. Another interesting feature of the tn. is the Groot Kerk of St. Stephen, which was originally built in 1272, and contains a monument of Catherine of Bourbon (d. 1469). There are extensive manufs. of beer, Prussian blue, and leather, as well as of pottery, cigars, and gold and silver work.

Nijmegen figured prominently in the Anglo-Amer. operations on the W. front in Sept. 1944, being involved in the plan to acquire flanking bridgeheads across the lower Rhine beyond the main fortifications

of the Siegfried line (q.v.) in the hope of quickly turning the Ger. N. flank and so ending the war earlier than might have been expected. This operation to seize the lower Rhine bridges comprised an airborne operation to capture the vital bridges over the Maas, Waal, and lower Rhine at Grave, Nijmegen, and Arnhem and a land operation, on a very narrow front with a one-road communication most of the way, to advance through Eindhoven and Nijmegen. The Brit. 1st Airborne Div. was dropped furthest N. in the Arnhem area, the U.S. 101st Airborne Div. N. of Eindhoven, and the U.S. 82nd Airborne Div. in the Nijmegen area (Sept. 17). This latter div. soon captured the area between Grave and

Arnhem before it could rebuild its devastated commercial centre. A new double-track road has been constructed between Nijmegen and Arnhem. Pop. 95,000.

Nijni-Novgorod, see GORKY.

Nijni-Tagil, tn. in the Sverdlovsk Region of the R.S.F.S.R., 140 m. E. of Perm. There are chemical plants, machine-tool, armament, and steel works, and railway workshops. Pop. 159,000.

Niké (Gk. νίκη), in Gk. mythology, the goddess of victory, and, according to Hesiod, the daughter of Pallas and Styx, by whom she was sent to fight on the side of Zeus against the Titans. She is generally represented as winged, and with a wreath and a palm branch. As herald of victory she also has the wand of Hermes. In the fifth century B.C. a temple was built in her honour at Athens.

Nikko, or Hatsuishi, tn. of Hondo, Japan, 80 m. from Niigata. It is one of the chief religious centres of the country, and is much visited on account of its famous temples and the sepulchres and sanctuaries of the first and third shoguns of the Tokugawa dynasty. Pop. 5000.

Nikolas of Cusa, see CUSA.

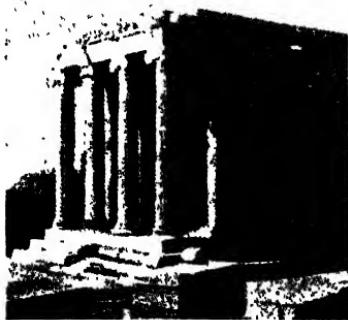
Nikolayev (Nikolaev), tn. and naval station of Russia, on the Black Sea, 41 m. N.W. of Kherson. There are immense shipbuilding yards, and a floating dock for armoured ships. N. has also steam flour-mills (at the riv.-port are the largest grain elevators in Europe), iron and machinery works, railway wagon works, and saw-mills; it manufactures soap, tobacco, vinegar, carriages, and agricultural implements. N. is the chief port for the export of cereals from the most fertile areas of S.W. Russia. Iron from Krylov Rog and manganese from Nikopol are also exported. Like Kherson, it has developed at the expense of Odessa, both being more conveniently situated for the grain exports of the Ukraine. N. is cap. of a region of the same name, having a pop. of 629,000. Pop. of tn. 167,100.

Nikolayevsk (Nikolaiev): 1. Tn. in the Khabarovsk ter. of the R.S.F.S.R., on the R. Amur, 23 m. from its entrance into the Pacific. Timber from the coniferous forests to the north of Khabarovsk is carried down the Amur to the port of N. N. is the centre for the Amur fisheries. Millions of tins of preserved fish are produced at its mechanised canneries. Pop. 16,500. 2. Tn. in the Saratov Region, see PUGACHEV. 3. Tn. of Poland, see SOSNOWIEC.

Nikolsburg, or Mikulov, tn. of Moravia, Czechoslovakia, 26 m. S. of Brünn. It has a château of Prince Dietrichstein-Mensdorff. The preliminary treaty of peace between the Prussians and Austrians was signed here in 1866. Pop. 6000.

Nikopol, tn. in the Zaporozhe Region of the Ukrainian S.S.R., on the R. Dnieper, 160 m. from its mouth. There are rich manganese mines in the dist., 957,000 tons being produced before 1939. Pop. 57,800.

Nikopoli, or Nicopoli, fort. tn. of Bulgaria, on the Danube, 24 m. N.N.E. of Pleven. The tn. was the scene of the defeat of Sigismund and his hosts in 1386 by Bayazid I., and was captured and



THE TEMPLE OF NIKE-APTEROS, ATHENS

Nijmegen so that the armoured advance on the tn. of Nijmegen itself was rapid. But Nijmegen was strongly held by the Germans, as also was the very important five-span road bridge of steel and concrete crossing the Waal. An attempt to get through to the bridge on Sept. 19 failed against the Ger. anti-tank guns sited in houses near the approaches. On the next day a regiment of the 82nd Div. surprised the Ger. holding the N. approaches. The British troops, meanwhile, had seized the S. end, and the allied armour then crossed the bridge and advanced 2 m. to the N. In the next few days there was much confused and heavy fighting between Nijmegen and Arnhem. Repeated Ger. attacks against the thin allied line of communications necessitated the temporary withdrawal of armour from Nijmegen to keep the single road open; but gradually, as the line was strengthened, a firm front was established along the Waal and Maas (for further details see under WESTERN FRONT IN SECOND WORLD WAR).

Nearly the whole shopping area of Nijmegen was destroyed by bombing and shelling; but soon after the war temporary shops of good design were erected as an emergency measure in order to obviate the risk of the tn. losing its trade to the rival

burnt by the Russians under Krüdener in 1877. Pop. 6000.

Nikosia, see NICOSIA.

Nile (from the Semitic *nîhal*, a riv.), longest and most important riv. of Africa, and only surpassed in length by the Mississippi-Missouri among the

rivs. of the world. It rises in the vast lake of Victoria Nyanza, which stands at an altitude of 3900 ft. above sea level. None of the rivs. which flow into this lake is sufficiently large, in relation to the size of the lake, to be a source riv. The chief trib. is the Kagera, the length of which, from the source to Victoria Nyanza, is 530 m. The Nile leaves the Victoria Nyanza at its N. extremity, and flows in a N.W. direction, passing through the Ibrahim and Koga Lakes. The riv. leaves the central African highlands at Fauvera and turns westward, being known now as the Somerset Nile. Between Fauvera and the Albert Nyanza the riv. falls at least 1000 ft., with many cataracts, such as the Murchison Falls (118 ft.). After leaving this lake, and receiving as a trib. the Semlike Nile from Lake Albert Edward, the riv. begins its northerly course and soon flows through the plains of the E. Sudan. It is now navigable, and is in character like a riv. of the lowlands, having a sinuous course. The main riv. is split up into sev. channels; at 7° 30' N. the two main arms are the Bahr-el-Jebel and the Bahr-el-Seraf, which join again about 9° 30'. The Bahr-el-Ghazal here flows into the main stream, and deflects it for a short distance to the E., but when the Sobat joins it the course once more turns northwad. From Fashoda to Khartoum the riv. is known as the White Nile (Bahr-el-Abyad), and the name 'Nile' simply is given to it only after the junction with the Blue Nile (Bahr-el-Azrek), which joins it at Khartoum, flowing from the Abyssinian tablelands. The Atbara is the last trib., which joins the Nile at a point 200 m. below Khartoum, and is a large riv. in the rainy season, though greatly reduced in the dry. The Libyan and the Red Sea plateaus, which approach the riv. in succession, are the cause of its sinuous course in Nubia. Between 16° and 24° N. lat. there are six groups of cataracts, the largest being at Wadi Halfa. From the junction of the Atbara to the

see the Nile does not receive a single trib., the lower basin being hence very small in area, varying in width from 1 to 12 m., that is to say, the region over which the ann. inundations of the riv. extend. This region increases from less than 1 m. in Nubia to as much as 12 m. in upper Egypt, and it is the extent of the inundation which determines the pros-

perity of the country during the ensuing season. N. of Cairo the delta of the Nile, which has a width of 120 m. and an area of 8500 sq. m., commences, with many canals, lakes, etc. The most important branches are the Damietta and the



THE RIVER NILE

Rosetta, each having a length of 146 m. Irrigation was begun by Mohammed Ali; in 1842 he called in Mougel Bey, a Frenchman, who built the Cairo barrage. Water was conducted to the land by irrigation canals, but the control of the water robbed the land of silt, and its productivity decreased. Bey's barrage was used until 1883, when Brit. engineers

rebuilt it, increasing the depth of water so that it travelled down the irrigation canals with increased velocity and carried the silt with it. The Aswān (Assuan) dam, which was begun in 1895 and finished in 1902, was heightened in 1912. From Dec. to March the sluices are closed and the waters held until the maximum capacity of 2½ milliards of cubic metres is reached. Before March and July the water is drawn off into the irrigation canals. S. of Aswān for 200 m. the riv. is one large reservoir. Above the Aswān dam is a barrage at Esna, made by placing suitable booms at an angle of 45° to the stream and there is another barrage at Assut. Assut dam gave new life to an irrigation system which was 3000 years old. A dam at Sennar, 170 m. S. of Khartoum, has been constructed to hold up the waters of the Blue Nile. It was finished in 1925, and is nearly 2 m. long. The Aswān reservoir holds 5,500,000,000 cubic metres of water, and the Gebel Aulia reservoir (completed in 1937) 2000,000,000 cubic metres. New barrages have been constructed at the bifurcation of the Nile below Cairo to replace the existing structures which, having been built in 1861, were unable to meet the conditions following the increase in summer supplies, the reclamation of considerable waste lands, and the earlier watering of food crops. The Mahmudick Canal, which connects the Rosetta with the Alexandria Nile, is of great commercial importance. At high water there is continuous communication between Fort Berkeley and the sea, a distance of 2900 m., but in periods of low water the cataracts impede the navigation. All the year round navigation is possible between Khartoum and Fort Berkeley (1090 m.), and also from the sea as far as Mansura (60 m.) on the Damietta, and as far as Kafr-el-Zayab (70 m.) on the Rosetta branch. The annual rise of the middle and lower Nile is due to the periodical rains of Abyssinia and equatorial Africa. The White Nile constitutes a more uniform source of supply, whilst the Blue Nile and the Atbara, when swollen by three months' rain, cause the inundating floods. A series of new projects has been formulated to bring the Nile under control so that every possible cubic foot of its water will be utilisable. The principle of the projects is 'century' or continuous storage, enabling the maximum supply in abundant years to be conserved for lean years. The first of the new projects is the Owen Falls dam on Lake Victoria, the object being not only to utilise to the greatest possible degree the waters of the White and Blue Niles and their trib., but also to safeguard against flooding and its concomitant famine. At present much water goes to waste, for excess supply from years of plenty cannot be stored. Yet in low years all the water that can be stored from the flood still falls short of normal crop requirements. Even if its size permitted, excess water could not be stored in a reservoir like Aswān because of evaporation losses. Adequate storage is possible

only in the great lakes of central Africa—Victoria, Albert, Kioga, and Tana. On these lakes evaporation and rainfall are nearly equal and, in fact, rainfall may exceed evaporation. In the great lakes a far greater volume of water could be stored without much increase in surface area, and therefore in evaporation, an important consideration when a reservoir may be held at high levels for many years. The White Nile's capacity is, however, limited by the swamps of the Sudd, N. of Mongalla. In these swamps a high proportion of the flow is lost through evaporation and plant transpiration, so that out of 100 cub. ft. leaving Mongalla, only 62 reaches Aswān. It is therefore planned to cut a by-pass canal, the Jonglei diversion, round the swamps. Its size will depend on the discharge, and the velocity of the water must be sufficient to prevent the growth of weeds and papyrus. Lakes Victoria and Tana are to be the main reservoirs, Lakes Albert and Kioga being used as regulators. At the outlet from Tana there would be a hydro-electric station, as at Owen Falls. At present about 6,000,000 feddans (or ac.) is irrigated in Egypt, and less than 500,000 in the Sudan. The new projects would supply enough water for 7,000,000 feddans in Egypt and 2,000,000 in the Sudan. The whole scheme may take twenty to twenty-five years, and it may be as long as twenty years more if there were a succession of bad years before the Victoria reservoir fills. The Owen Falls dam, a concrete and masonry structure over 400 yds. long and 30 yds. high, should take about four years to build (*The Times*, Aug. 11, 1949). The Nile has the longest basin of any riv., although the area of that basin (1,107,227 sq. m.) is surpassed by those of the Amazon and Mississippi; the length from the outlet at the Victoria Nyanza is 3473 m. Considering the great importance of the Nile to Egypt, it is not surprising that in ancient times it was deified, and has always been regarded with the utmost reverence; the height of the flood has been recorded annually since at least 3600 B.C. It was not until the latter half of the nineteenth century that the question of the source of the Nile was finally settled. Sir J. H. Speke discovering the Victoria Nyanza in 1858; Bruce had in 1770 discovered the source of the Blue Nile.

See Sir S. W. Baker, *Nile Tributaries of Abyssinia*, 1880; Sir H. Johnston, *The Nile Quest*, 1903; W. E. Garstin, *Report upon the Basin of the Upper Nile*, 1904; H. G. Lyons, *Physiography of the Nile and its Basin*, 1906; J. H. Speke, *Discovery of the Source of the Nile*, 1908; Sir W. Willcocks and J. I. Craig, *Egyptian Irrigation*, 1913; A. Moret, *Le Nil et la civilisation égyptienne*, 1926; E. Ludwig, *The Nile* (Eng. trans., 1940); and H. E. Hurst and R. P. Black, *The Nile Basin*, 1945.

Nile and Red Sea Railway was opened in Jan. 1906. As its name indicates, it establishes communication between the Nile and the Red Sea. The line runs from Berber on the Nile to Port Sudan, situated 45 m. N. of Suakin, on the Red Sea.

Nile, Battle of the (1798), see ABOUKIR.

Nile, Blue, see BAHR-EL-AZREK.

Nile Province (now Northern Province), prov. of Uganda, Central Africa, Brit. protectorate comprising the dists. of Karamoja, Lango, Acholi, and W. Nile. The soil is fertile, and coffee, cotton, and indigo are grown; there are rubber and ebony trees.

Niles: 1. Ta. of Trumbull co., Ohio, U.S.A., on the Mahoning R., 54 m. E.S.E. of Cleveland. The chief industries are the manuf. of sheet iron and steel boilers, railway cars, chemicals, etc. Pop. 17,000. 2. Ta. in Berrien co., Michigan, U.S.A., on both banks of the St. Joseph R. It is a railway centre, ships fruit and livestock, and manufs. flour, furniture, etc. Pop. 11,000.

Nile, White, see BAHR-EL-ABIAH.**Nilgai, see NYLGHAU.**

Nilgiri, or Neillgherry Hills (Blue Mts.), plateau in India, S. of Mysore, with a general elevation of 6500 ft., the highest peak being Dodabetta (8760 ft.). The hills were first explored by Brit. officers in 1814. The climate is healthy and invigorating. The area is a dist. of Madras prov., totalling 989 sq. mi. with a pop. of 209,700.

Nilometer is, as its name indicates, an arrangement for measuring the height of the Nile in Egypt. There were sev. such arrangements in anct. times, as the height of the riv. was then, as now, the factor which determined the country's measure of prosperity for the year. On the is. of Elephantine, near Aswān, there is a N. which dates back to Egyptian times. It was extended by the Romans, and repaired by the Khedive Ismail in 1870. On the is. of Rhoda, opposite Cairo, there is another such N., which was constructed during the reign of Caliph Al-Mutawakkil (847). It consists of a square well, which is connected with the Nile by a canal; in the centre is an octagonal marble pillar, graduated in cubits (21 386 in.). If the rise reached 19 cubits it was fairly good, 22 excellent, but 24 ruinous; the average rise at Cairo is from 24 to 26 ft. Other Ns. in anct. times were situated at Philae, Edfu, Esna, Memphis, Ekhmin, etc.; modern gauges are now situated at Cairo, Aswān, Berber, and Khartoum in the main riv. and some on the trib.

Nilotes, one of two large groups of hamiticised Negroes of the Anglo-Egyptian Sudan, the other being known as the Nilo-Hamites. The latter belong to the Bari section of the Bari-Masal linguistic group for which it is difficult to find an appropriate name, though linguistically the term is permissible. Physically both groups are distinguished by dolicocephalic skulls and are of very tall stature. These characteristics, most marked in the N., leave little doubt that stature greater than either parent stock is one of the results of the mixing of Negro and Hamite. The N., numerically the strongest of the sub-racial units of the Sudan, occupy a vast area from 12° north lat. west into Uganda, including in the W. by far the greater part of the basin of the Bahr-el-Ghazal, and extending E. of the

Nile between that riv. and the Pibor-Sobat in the Upper Nile prov. The N. include the Dinka (or Denka, q.v.), the Nuer (q.v.), and Shilluk (q.v.) tribes, together with one or two smaller tribes such as the Anuak. All these tribes, besides being tall and long-headed, are very dark-skinned and woolly-haired, their skin having no sign of the coppery tinge noticeable in the shorter, rounder-headed folk dwelling in the S. part of the Bahr-el-Ghazal prov. Although their features are usually coarse and their noses broad ('platyrhine') there may, among the Shilluk, be found men with long, well-shaped faces, thin lips, well-modelled foreheads, and noses the reverse of coarse. The Denka and Nuer have broader noses than have the Shilluk. Temperamentally the N. offer a strong contrast to all other Sudanese peoples. They are aloof, proud, tenacious of their traditional beliefs, and very religious, asking nothing of the white man except to be left alone, and only yielding slowly to the unremitting pressure brought to bear by the gov. and missionary. These characteristics are common to the N., but are more marked in the Denka and Nuer than in the Shilluk. The Sudanese representatives of the Nilo-Hamites are less markedly characterised physically than the N. Linguistically the majority of the tribes included in the group are related to such strongly hamiticised peoples of Kenya colony as the Masai and Nandi (tribes termed by some anthropologists as half-Hamites). The main distribution of the Nilo-Hamites is in the Kenya highlands and are not further treated in this article, which is more concerned with the tribes of the Nilotic or Anglo-Egyptian Sudan.

The N. are mostly herdsmen, cattle being of the highest importance to them, for there is barely enough grain to feed the people and make beer. They carry spear and shield and wooden clubs. They dislike clothing; men go naked or wear a cloth over the shoulders. The hair of the head is often worked into an elaborate headdress. Women wear leather petticoats reaching to the knee. Ivory bracelets are worn above the biceps, smaller ones at wrists. They have a clan organisation, as indeed have all great sub-racial units of the Sudan. The rain-maker is a well-established institution among all the racial units. With the N., however, the rain-maker is more than an expert. With the Shilluk and Denka he is a divine king in whom is imminent an ancestral spirit and who, by prayer, moves a god in the firmament to send rain. These divine rulers are, or were, killed ceremonially for the benefit of their people. It is a belief of the Denka that the ruler takes the food of the land with him to the grave; but if the underlying idea of this belief is the spiritual unity of rain-maker, rain, and vegetable food (an idea which is not limited to the Denka or even to the N. as a whole), it is curious that the belief is not recorded of other tribes. Like other African peoples, the N. have a

profound belief in magic, this everywhere being the greatest obstacle facing the administration in attempting to impose European conceptions of justice, for magic is woven into the whole structure of African society and is an essential feature of the African's social heritage. Everyday life with the N. (as of the Nuba (q.r.) and other races) is based on the kinship system. The family, in its narrowest sense, is associated with a wider circle of relatives, all of whom are constrained by more formal regulations than in W. society. Kinship terms are used among the group of persons linked together by the system, and an understanding of the system is necessary to an analysis of the position in which each individual stands to his relatives and of his obligations and privileges, and the forms of etiquette by which he is bound. Polygamy, as with so many African tribes, is a social institution of the N. Each wife owns her own hut and is individually responsible for the care and feeding of her own children. Contact with the white man has, for two decades or more, produced two great changes among the N., and peoples of the Sudan generally: the abolition of tribal warfare and the diminution of the public status of the medicine-man (see WITCH-doCTOR), the individual who throughout the Anglo-Egyptian Sudan is known as *kojur* (a word of unknown etymology), though the private personal prestige of the successful medicine-man is probably almost as high as ever. See C. G. Seligman and Brenda Z. Seligman, *Pagan Tribes of the Nilotic Sudan*, 1932.

Nilotic Languages, see under NEGRO-AFRICAN LANGUAGES.

Nilsson, Martin Persson (b. 1871), Swedish archaeologist, was educated at Lund, Basle, and Berlin Univs. Lecturer in Grk. (1900) and prof. of classical archaeology and anct. hist. from 1910 at Lund Univ., he became Sather prof. of classical literature at California Univ. in 1939. N. has written many works on archaeology and anct. Greece, including *Grchische Feste* (1906); *Primitive Time Reckoning* (1920); *A History of Greek Religion* (1925); *The Minoan-Mycenian Religion and its Survival in Greek Religion* (1927); *Mycenian Origin of Greek Mythology* (1931); and *Homer and Mycenae* (1933).

Nimar: 1. Dist. in the Nerbudda div. of the Central Provs. of India, having an area of 3357 sq. m. Cotton, millet, and hemp are the chief crops and there are factories for ginning and pressing cotton at Khardwa, which is also the administrative headquarters. Pop. 254,000. 2. Dist. in the state of Indore, on both banks of the Nerbudda, with an area of 3372 sq. m. Pop. 254,700.

Nimburg, tn. of Bohemia, Czechoslovakia, on the Elbe, 26 m. N.E. of Prague. Pop. 8000.

Nimbus, see under CLOUD. For the meaning of the word in art see AUREOLE.

Nimeguen, see NIJMEGEN.

Nimes, city of France, cap. of the dept. of Gard, 80 m. from Marseilles and 31 m.

from Montpellier. It is famous for its Rom. remains, among which may be mentioned the amphitheatre, which dates from about the second century A.D., and is one of the best preserved in France. Besides this there are the Maison Carrée, a beautiful temple in the style of the Parthenon; the temple of Diana; the Porte d'Auguste and the Porte de France, two Rom. gates; and the Tour Magne, the oldest monument of the tn., which is still 92 ft. high. Other buildings are the cathedral (St. Castor); the old citadel dating from 1687, and now used as a central prison; and the former lycée, which contains the public library and the museums. The city is the seat of a bishop. It is also one of the great S. markets for wine and brandy, and has a good trade in grain, groceries, and colonial wares. The chief manufs. are silk goods, upholstery, shawls, carpets, cotton goods, candles, machinery, boots and shoes, and brandy. Jean Nicot, who introduced tobacco into France, was from N., also François Guizot, the historian, and Alphonse Daudet, the novelist. Pop. 89,200. See E. Espérandieu, *Le Pont du Gard et l' aqueduc de Nîmes*, 1926, and *La Maison Carrée à Nîmes*, 1929.

Nimitz, Chester William (b. 1885), Amer. Adm., b. in Fredericksburg, Texas, U.S.A., son of Chester Bernhard N. Graduating from the U.S. Naval Academy, 1905, he became ensign in the U.S. Navy in 1907. Having serv. years experience as a submarine officer before the First World War, N. was lieutenant-commander of the Atlantic submarine flotilla, 1916, and, in 1918, chief of staff to the commander of the Atlantic fleet's submarine force. From 1933 to 1935 he was commanding officer of the U.S.S. *Augusta*. Promoted to rear-admiral in June 1938, he was chief of the bureau of navigation in the Navy Dept. 1939-41. On Dec. 17, 1941, following the Jap. attack on Pearl Harbour, the naval high command was overhauled and N. became commander-in-chief of the Pacific fleet, with the rank of admiral. N. then reorganised his fighting groups and strategy, selecting as leaders Halsey, Mitscher, Kincaid, Spruance, and Turner. He was responsible for the reconquest of the Solomon Is. in 1942-43, of the Gilbert Is. in 1943, and of the Marianas and Marshalls in 1944. With the withdrawal of the Jap. fleet to the inner seas there was a regrouping of the Amer. naval forces in the Pacific. Gen. MacArthur was given the Seventh Fleet as part of his command, Adm. Halsey was assigned to the Central Pacific as commander of the Third Fleet, which, with the Fifth Fleet under Adm. Spruance, was put under the supreme direction of Adm. N. MacArthur invaded Leyte, aided by immense naval forces sent to his support by N. N. directed the initial stages of the invasion of Okinawa (1945). (See PACIFIC CAMPAIGNS, or FAR EASTERN FRONT IN SECOND WORLD WAR.) In Dec. 1945 he was promoted to the five-star rank of fleet admiral of the U.S. Navy. In common with most distinguished naval officers N. is opposed to the

merger of the armed services. In March 1949 he was appointed by the United Nations as administrator for the plebiscite in Jammu and Kashmir (*q.v.*) in conformity with the terms of the last interim report of the United Nations Commission for India and Pakistan.

Nimonic, see under NICKEL.

Nimrod. According to Genesis a son of Cush and grandson of Ham, famous for his exploits as a hunter. He was at first ruler of Shinar, and afterwards founder of the Assyrian Tetrapolis (Resen, Nineveh, Ichoboth-Jr, and Calah). He is sometimes identified with the prin. hero of the Babylonian Izdubar legends. or 'N. Epic.'

Nimrod, see APPERLEY, CHARLES JAMES.

'Nine Days Queen,' see GREY, LADY.

Nine-power Agreement, treaty made in 1923 between Great Britain, the U.S.A., France, Belgium, Italy, Holland, Portugal, China, and Japan, to guarantee the sovereign independence and territorial and administrative integrity of China. The signatories pledged themselves to help China to maintain a stable gov./ while other clauses estab. the principle of the 'open door' in Chinese trade and forbade the powers to seek special privileges in China. Japan violated the treaty in 1930 by occupying Manchuria and by starting a large-scale war in China in 1937. In that year the treaty was invoked and a conference of the signatories was held at Brussels (Nov.) but to no purpose.

Nineteen Thirty-nine-Forty-five Star, see under STAR (decoration).

Nineveh, a cap. of ancet. Assyria. According to all account it was a city of size, strength, and magnificence. The ancet. city is represented by two large mounds known as Kuyunjik and Nebi Yunus ('Prophet Jonah': the site of the reputed tomb of the prophet Jonah), situated on the E. bank of the Tigris, opposite the modern city of Mosul. In the Neolithic period, there existed a small vil. During the first three centuries of the Assyrian Empire, N. was a poor place. Sharrukin (or Sargon) II. (721-705) had made his cap. successively at Ashur, Calah, and N., and then finally at Dur-Sharrukin or Khorsabad. The real founder of the great N. was Sargon II.'s son and successor, Sennacherib (704-681 B.C.). He planned the fortifications of this city, restored its temples, built its most magnificent palaces, and gave it a system of waterworks: he conducted water from the hills by eighteen canals, and distributed it round the moats into the ponds and tanks within the city. It is computed that his great palace contained not less than 10,000 ft. of walls lined with sculptured slabs. Ashurbanipal's reign (669-633 B.C.) was the 'golden age' of Assyria and of N. His important work was the estab. of the great royal library at N. In the temple of Nabu at N. one library had already been in existence at least since Sargon II., but Ashurbanipal's library was to surpass all others in size and importance. He sent to all the old temples of Babylonia and had copies made of their mythological epics,

hymns, and incantations. Tens of thousands of clay tablets were collected, containing chronicles, medical and other scientific literature, dictionaries, religious literature, official dispatches, and archives, business documents, and letters. They form the basis of our knowledge of the Assyrian and Babylonian language, literature, and hist. With the death of Ashurbanipal, the Assyrian period and that of N., had really closed. The kingdom and N. continued for twenty years more, but they were the years of a lingering death.

The story of N.'s fall is told by a Babylonian clay tablet preserved in the Brit. Museum: N. fell in 612 B.C., the fourteenth year of the Babylonian king Nabopolassar (625-605 B.C.), who was joined in the destruction of this city by Cyaxares the Mede and the Scythians. The destruction of N. was predicted by the prophet Zephaniah (ii., 13-15), and in the book of Nahum (iii., 1-3) we have an ecstatic expression of delight at the prospect of ruin overtaking the hated city ('bloody throughout'). N. in its prime was, no doubt, a city of great magnificence. It was constructed of brick and enamelled tile, or of stone brought from the distant mts. It was surrounded by brick walls sixteen m. in length. Winged bulls and lions with human heads, and sculptured sphinxes with wings, guarded the gates of the royal palace, while its numerous rooms were decorated with bas-reliefs, mouldings, and carvings, giving evidence of no little artistic skill. A vast number of reliefs and inscriptions are preserved in the Brit. Museum.

Research.—Early in the nineteenth century, Claude James Rich, resident of the East India Company at Bagdad, visited the mound Kuyunjik (and others), where he made slight excavations. In Dec. 1842, Paul Emile Botta (of It. parentage), a Fr. vice-consul at Mogul, began digging on the site of N., but he worked there only for three months. He was followed by Victor Place. The excavations, begun by a young Englishman of Huguenot descent, Austen Henry Layard, in 1843, at Nimrud (the Biblical Calah) and Kuyunjik, constitute the next great landmark in the hist. of modern archaeology. In 1847 Layard discovered at N. the palace of Sennacherib, which was largely unearthed from 1849 to 1851. In 1852, Hormuzd Rassam (who had been one of Layard's helpers) continued the excavation of N. under the direction of Sir Henry C. Rawlinson, the Brit. consul-general at Bagdad. Rassam, who worked until 1854, had the good fortune to find Ashurbanipal's palace and his great library. In Dec. 1872, George Smith, of the Brit. Museum, announced that among the tablets from N. he had found an account of the flood which closely resembled that in the Bible. This aroused so much interest that the *Daily Telegraph* commissioned Smith to undertake further explorations. George Smith worked at N. in 1873 and 1874. In 1876 and 1877, Rassam again excavated, on behalf of the Brit. Museum. Finally, also on behalf of

the Brit. Museum, in 1931-32, M. E. L. Mallowan (now prof. at the Institute of Archaeology, Univ. of London) excavated the first prehistoric settlement at N., underlying the Assyrian levels. See A. H. Layard, *Discoveries in the Ruins of Nineveh and Babylon*, 1853; C. J. Gadd, *The Fall of Nineveh*, 1923; S. Smith, *Early History of Assyria*, 1927; R. C. Thompson and R. W. Hutchinson, *A Century of Exploration at Nineveh*, 1929; B. Meissner and D. Opitz, *Studien zum Bit Hilani im Nordpalast Assurbanipis zu Nineveh*, 1940.

Ningpo (Ning-po-fu, city of the calm waves), formerly Liampo, a treaty port and important trading city of Chekiang prov., China, on Takia or Ningpo R., 16 m. from its mouth opposite Chusan, and 95 m. from Hangchow. Manufa. include silks and other fabrics, gold, silver, and lacquered wares, carved wood, furniture, carpets, and confections. Tea, raw cotton, drugs, and straw goods are among the exports. Bamboos and rice are grown. There are salt works and fisheries near by. The ruined Pagoda or Obelisk (*T'ien-feng-t'a*) and the old Drum Tower are interesting buildings. N. contains numerous temples (e.g. that of 'the Queen of Heaven'), monasteries, schools, and clubs, and a fine library. It is noted as an important missionary centre. There was a Portuguese settlement from 1522 to 1545. A Brit. occupation took place in 1841-42, and in the latter year the port was opened to foreign trade by the treaty of Nanking. It serves as a distributing station for Shanghai. Pop. estimated at (1949) 218,800.

Ningxia, prov. of Inner Mongolia, China, inhabited by Mongol-speaking Khalaks and Burials. Through the centre of the prov. run the Alaskan mts. Wheat, wool, and livestock are produced. The city of N. is the cap., and has canals for irrigation. Area 106,115 sq. m. Pop. 773,000.

Ningyuan, see KULJA.

Ninian, Saint (*d. 432?*), missionary preacher, probably from Strathclyde. He went to Rome and was ordained bishop of the S. Picts by Pope Siricius in 394. He founded the church of Candida Casa, or Whithorn, in Wigtownshire, and dedicated it to St. Martin of Tours. According to Bede, he preached Christianity to the Picts of all S. Scotland as far N. as the Grampians. See Bede, *Historia Ecclesiastica* and Alfred of Rievaulx, *Life of St. Ninian*.

Ninon de l'Enclos (1616-1706?), see L'ENCLOS.

Ninove, city in E. Flanders, Belgium, 20 m. S.E. of Ghent, on the R. Dender. There is a fortified city gate of the eighteenth century. It has manufa. of safety matches, cotton goods, linen, lace, silk, gloves, and shoes. Pop. 11,100.

Niobium (or Columbium, Cb), symbol Nb; atomic number 41; atomic weight 92.91. Discovered by Hatchett, 1801. A metallic chemical element, it is usually associated with tantalum, and occurs in the minerals tantalite, columbite, and fergusonite. The metal is obtained by reducing the chloride with hydrogen in a red-hot iron tube, or by reducing the oxide

with carbon in the electric furnace. It is a steel-grey metal of sp. gr. 7.06, burns on heating in air, and is soluble in warm concentrated sulphuric acid. Its resistance to corrosion makes it suitable for the manuf. of chemical apparatus.

Niort, city of France and cap. of the dept. of Deux-Sèvres, on the R. Sèvre-Niortaise, 42 m. E.N.E. of La Rochelle. It possesses a noted church of the fifteenth century, and an old castle in which Mine de Maintenon was born. The manufs. are boots and shoes, gloves, and brushes. Pop. 24,000.

Nipigon, Lake, sixth largest of Ontario's immense number of lakes, has an area of 1750 sq. m. and 800 m. of shore line, and lies 35 m. N. of Lake Superior, in a forest reserve of over 7000 sq. m. It is 70 m. long and 50 m. wide, is exceedingly deep, and contains over 1000 is. The R. Nipigon drains the lake, and is the largest which flows into Lake Superior. The lake is notable for the grandeur of its scenery and its wild primitive surroundings.

Nipissing, Lake, lake of Ontario, Canada, about half-way between Huron Lake and the Ottawa R. It is 50 m. long, 20 m. broad, and contains numerous is. The Sturgeon R. enters it on the N., and the outflow to Georgian Bay, Lake Huron, is by the Fr. It.

Nippon, **Niphon**, or **Dai Nippon**, native name for the whole of the Jap. Empire. It is used particularly of the prin. ls. of Japan, Honshu.

Nippon Yusen Kaisha (Japanese Mai Steamship Company Ltd.), most important steamship company of Japan, estab. in 1885. The Mitsubishi Kaisha and the Yubin Kisen Kaisha lines were formed as early as 1871, the two amalgamating (1876) as the Three Diamonds Company. In 1899 the Jap. Diet granted subsidies to the company's European and Amer. lines, which carried the mails. During the First World War further lines were added to the routes covered, including Java, Calcutta, New York, and the S. Pacific ls. The near sea services were incorporated in 1923 under Kinkai Yusen Kaisha and in 1926 the Joyo-Kisen was absorbed.

Nippur, or **Niffer**, was an anc. city of Babylonia, 100 m. S.E. of Bagdad. It was the seat of the worship of the Babylonian god, En-lil. Its hist. was continuous from Neolithic times to the Parthian rulers. The temple of En-lil finally became a Seleucid fortress. See C. S. Fisher, *Excavations at Nippur*, 1905.

Niquiran. Some scholars still use this term (while others prefer the term *Nicarao*, an abbreviation from *Nicaragua*) for the important language, now extinct, which was spoken, at the time of the Sp. conquest in the sixteenth century by the native pop. of the ter. lying between the Pacific Ocean and the Lake Nicaragua, and the neighbouring is. of this lake. Unlike Mangue or Chorotega (which is a Chilapanecan dialect), the other prin. language of Nicaragua, N. or Nahualt of Nicaragua belongs to Nahuatl linguistic family, being thus closely related to Aztec of Mexico and Pipil of Salvador, Guatemala, and Honduras. The origins

of the N.-speaking people is uncertain. According to some scholars (C. Thomas) they were a relatively recent colony, immigrated from the Pipil group of Salvador and Guatemala. According to W. Lehmann they immigrated in about the tenth century A.D. from Cholula in Mexico, and were connected with the Toltec. However, all scholars agree that N. (together with Aztec, Pipil, and other dialects) was a branch of Nahuatl, this being a subdivision of the Uto-Aztecian group of languages. The other two subdivisions were Piman or Sonoran, and Shoshonean. According to Sp. sources, the N. possessed codices written in pictographic script, but none has been preserved.

Nirvana, highest state of spiritual attainment for the Buddhist. Existence is a continual passage from one state into the next, man's earthly life being but one episode. This 'round' of existence is but a veil over reality. If ignorance, desires, and all other 'poisons' can be removed, the individual is delivered from his fictitious individuality, and from the 'round.' This is the state of N., and is completely discontinuous from the 'round.' N. cannot be defined, since the terms used by man bear no relation to it.

Nisan, see ABIB.

Nish, or Nis, fortified garrison tn. of Yugoslavia, and cap. of the dept. of N., on the l. b. of the Nishava. Its position is important from a strategic point of view; for it lies at the convergence of sev. of the important Balkan high roads, and also at a railway junction. It was captured by the Bulgarians in 1915. It is also a centre of commercial activity. There is a railway repairing factory and an iron foundry. N. is the see of a bishop and a royal residence. Constantine the Great was b. there. Pop. 50,700.

Nishapur, tn. of Khorasan, Persia, 44 m. S.W. of Meshed. Omar Khayyam was b. and buried here. There is trade in almonds and other fruits, and textile goods. Pop. 15,000.

Nisi Decree, see under DIVORCE.

Nisibis (alled Antiocha Mygdoniae during the Macedonian rule), cap. of anct. Mygdonia, N.E. Mesopotamia. It was taken by the Parthians in 149 B.C., and sev. times fell into the hands of Rome, being captured by Lucullus (68 B.C.), by Trajan (A.D. 116), and by Lucius Verus (A.D. 165). It was finally ceded by Jovian to the Persians in A.D. 363. The Armenian vll. of Ni-sibin, 85 m. S.E. of Diabekr, occupies the site.

Nisi Prius (literally 'unless before'). When the judges sit at the assizes to try civil actions they are still said to be 'sitting at N. P.' though the words N. P. have lost their original significance. N. P. denote no more at the present day than the commission by virtue of which judges are empowered to try civil causes at assizes. The words N. P. originated in the writ of *renire facias* (a writ addressed to the sheriff of a co. where a particular action was to be tried calling upon him to secure a jury) as altered in form by the Statute of Westminster II. to square

with a prevalent practice by which inconvenience to jurors was avoided. Prior to this alteration, if jurors were summoned from any part of England whatsoever, they were bound at least in theory to come up to Westminster (where the king's courts then were) and wait about until the case in which they were summoned came on. The result was that the inconvenience was partially mitigated by the practice of attorneys allowing the action to be pending in Westminster from term to term until such time as the justices were about to go on circuit to the particular co. whence the jurors had been drawn, and then transferring the case to those justices as soon as it was certain they were coming. The Statute of Westminster II. provided that the writ of *renire* should contain words to the effect that the sheriff should command the jurors to come to Westminster on such a day in such or such a term, N. P. (unless before) that day the justices appointed to take assizes should come into the co. in which the cause of action lay. *See also Assizes.*

Nith, Scottish riv., rising about 8 m. S. of Cunnock, Ayrshire, which flows S.E. about 60 m. through Nithsdale to enter the Solway Firth 10 m. S. of Dumfries.

Nithard (A.D. 790-844), Fr. historian, grandson of Charles I. He met his death fighting for Charles the Bald. His *De dissensionibus filiorum Ludovici prii* is a useful hist. of the Carlovingian Empire.

Nithsdale, William Maxwell, fifth Earl of (1676-1714), supported the Jacobites in their rising of 1715. He was captured after the battle of Preston, imprisoned in the Tower and condemned to death. His wife devised a plot and secured his escape; he fled to Rome and joined the Elder Pretender. The story of his flight was written by the countess of N., and pub. in the *Transactions of the Society of Antiquaries of Scotland*.

Niton, *see RADON.*

Nitrates, *see NITROGEN.*

Nitre, or Saltpetre, potassium nitrate (KNO_3); Chile saltpetre is sodium nitrate ($NaNO_3$). It is found on the ground and impregnating the upper soil in India and Persia; sodium nitrate is found in Chile and Peru. The soil is lixiviated and the pure salt obtained by crystallisation. Potassium nitrate is used in the manuf. of gunpowder, sulphuric acid, and nitric acid, and in medicine as a diuretic and diaphoretic. Sodium nitrate was used for the manuf. of potassium nitrate and sulphuric and nitric acids, and is an important fertilizer. It is now largely made synthetically. N. when heated evolves oxygen and is converted into potassium nitrite.

Nitrian Desert, *see NATRON LAKES.*

Nitric Acid and Oxide, *see NITROGEN.*

Nitriding (Nitrogen Case Hardening). Method of producing a very hard surface skin on steels by heating in ammonia at 500° C. for periods up to 96 hrs. A surface skin of nitrido is formed on all steels by this treatment, but in most cases the skin is brittle. But with special 'nitrally' steels, containing 1·4-1·7 per cent of chromium and 0·9-1·2 per cent of alu-

minum, the skin becomes intensely hard and firmly adherent. It resists wear and corrosion, and is used for surface hardening of gauges, spanners, gears, etc.; but it is not suitable for resisting severe localized pressure. The nitr alloy steels possess mechanical properties comparable with those of a high tensile steel.

Nitrification, process by which organic nitrogenous compounds in the soil are oxidised, the whole or greater part of the nitrogen being converted into nitrates, chiefly of calcium or potassium. It was believed to be a purely chemical process until 1877, when it was discovered to be due to the agency of minute bacteria. The process occurs in two stages, following the action of putrefactive bacteria which produce ammonium compounds; one type of bacteria oxidises these partly into nitrites, and another type completes the oxidation into nitrates. An adequate supply of oxygen and water, darkness, a suitable temp., and the presence of alkaline salts are essential to the process, which is the means by which plant foods are made available for the plants. Leguminous plants are noted for the colonies of bacteria on their roots, which fix atmospheric nitrogen. Hence the agric. practice of ploughing-in a crop of clover, etc.

Nitriles, esters of hydrocyanic acid or prussic acid. They form a series which may be prepared by heating the alkyl halogen compounds with potassium cyanide. The lower members, as methyl cyanide, or acetonitrile (CH_3CN), and ethyl cyanide, or propionitrile ($\text{C}_2\text{H}_5\text{CN}$), are colourless liquids with a somewhat pleasant odour, and are miscible with water. The higher members are insoluble. The N. have corresponding isomers known as isonitriles, carbarylamines, or isocyanides. They are poisonous colourless liquids of disagreeable odour. The aromatic N., e.g. $\text{C}_6\text{H}_5\text{CN}$, are also of importance. All N. on hydrolysis with caustic potash yield the potassium salt of the corresponding acid, e.g. $\text{CH}_3\text{CN} + \text{KOH} + \text{H}_2\text{O} = \text{CH}_3\text{COOK} + \text{NH}_3$.

Nitrites, see Nitrogen Compounds.

Nitrobenzene ($\text{C}_6\text{H}_5\text{NO}_2$), nitrated derivative of benzene. It is usually prepared by slowly adding to ten parts of benzene a mixture of twelve parts of nitric acid of sp. gr. 1.45 and sixteen parts of concentrated sulphuric acid at a temp. under 40°C . The vessel should be kept moving so as to keep the various constituents in contact, and when all the acid has been added, the mixture is heated to about 80° for half an hour, and then cooled. The N. collects at the top of the vessel, and after separation and washing with water, when it forms the lower layer, it is dried over calcium chloride and distilled. N. is a pale yellow oil with a strong smell of bitter almonds. It has a sp. gr. of 1.2 at 20° , and boils at 205° ; it is very slightly soluble in water. It is used for the manuf. of aniline and benzidine, and for flavouring and perfuming purposes under the name of 'oil of mirbane,' in spite of its poisonous nature. (1:3) metadinitrobenzene is a solid, obtained by using a higher temp. for the nitration. Other N.s. are ortho-dinitro

(1 : 2), para-dinitro (1 : 4), and trinitro (1 : 3 : 5), which is an explosive.

Nitro-cellulose, or Gun-cotton, compound formed by the action of nitric acid on cellulose. The word N. is a misnomer, and should be 'cellulose nitrates.' The chemical constitution of cellulose is itself a matter of doubt, and ordinary gun-cotton probably contains a mixture of nitrates, though $\text{C}_6\text{H}_10(\text{NO}_2)_3$ is usually given as the formula. N. was prepared by Schönbein of Basle in 1846 by the action of strong nitric acid on cotton. In the modern method a mixture of concentrated sulphuric and nitric acid is employed, the idea being that the nitric acid is maintained in an anhydrous state in solution in the sulphuric acid, and that there is always sufficient excess of sulphuric acid to take up any water which may be produced during the reaction. Attempts were made to utilise gun-cotton as an explosive, but without success until it was produced in the form of a colloid by the action of certain solvents, as acetone (see CORDITE). The lower nitrates of cellulose are used in the preparation of artificial silk and of celluloid. The danger arising from the inflammable nature of nitrated cellulose in films for cinematograph purposes has led to the employment of other cellulose compounds, with some measure of success. Collodion is a mixture of the lower nitrates with alcohol and ether. See CELLULOSE; COTTON; PYROXYLIN.

Nitro-compounds, or Nitro-derivatives, those compounds which contain the

compound radicle $\text{N} \equiv \text{O}$ (as opposed to $\text{O} \equiv \text{N} = \text{O}$ in the nitrates) directly attached to a carbon atom.

When an aromatic compound such as benzene is treated with nitric acid of sp. gr. 1.3 to 1.5 at ordinary temps., a mononitro-compound is usually produced; and, generally speaking, the more concentrated the acid and the higher the temp. employed, the larger will be the number of NO_2 groups introduced into the molecule. The product is in such cases a mixture of dinitro and trinitro derivatives. The concentration of the acid is usually effected by mixing the nitric with a larger proportion of concentrated sulphuric acid, which effectively absorbs the water produced in the reaction, and maintains the nitric acid in a concentrated condition. The N. are for the most part yellow, stable, crystalline substances, only slightly soluble in water, but readily soluble in alcohol, ether, etc. The higher N. such as nitric acid and T.N.T. can be detonated and form widely used high explosives. With various reducing agents, as tin, with hydrochloric acid, N. are converted to amino-compounds, thus nitrobenzene ($\text{C}_6\text{H}_5\text{NO}_2$) is converted into aminobenzene or aniline ($\text{C}_6\text{H}_5\text{NH}_2$). The N. of the aliphatic bodies are obtained by the action of silver nitrite on a alkyl halide, and only very rarely (e.g. with octane) by the action of nitric acid on the hydrocarbon.

Nitrogen, non-metallic chemical element, symbol N, atomic number 7, atomic weight 14.008 (Fr. *azote*, without life). At ordinary temps. it is a gas, and occurs in an uncombined state in the atmosphere, forming approximately 78.1 per cent of air by volume. It also occurs combined with other elements in animal and vegetable substances; in various minerals as ammonium salts; in the form of nitrates in Chile saltpetre and other deposits found in the soil. The gas is colourless, tasteless, and odourless; it is slightly soluble in water, to a less degree than oxygen; it is slightly lighter than air. Liquid N. boils at -194°C . and solidifies to a white body at -214°C . N. was discovered as a constituent of the atmosphere by Rutherford in 1772. It was recognised as an extremely inert gas, and all attempts to bring about direct combination with other substances for a time failed. In 1785 Cavendish showed that N. combined with oxygen in the neighbourhood of an electric spark discharge. This method was used by later investigators, and in 1894 Lord Rayleigh demonstrated the presence of argon in the atmosphere by causing all the N. in a sample to be combined in this way. In 1892 Sir Wm. Crookes showed that the electric arc caused the formation of a N. and oxygen compound. This has been put to commercial use.

The artificial production of N. compounds derives its importance from the part played by N. in vegetable life. N. does not constitute a large proportion of the elements contained in vegetable matter; but it is a very essential constituent, and, as far as is known, most plants are unable to utilise the N. of the atmosphere directly. The N. used in building up the tissues of plants is contained in the soil in the form of nitrates, ammonium compounds, etc. These nitrates may owe their existence, in part, to the activities of certain micro-organisms which have the power of causing the combination of atmospheric N. Under ordinary circumstances cultivated land uses up the nitrates thus formed more rapidly than they can be replaced, so that the N. supply has been a problem to the agric. world. Experiments have been successfully made in the direction of cultivating bacteria of peculiar effectiveness as regards production of nitrogenous compounds, but the usual method is to dress the soil with manures consisting largely of nitrogenous material. The main source of nitrogenous manure was for long the natural deposits found in vast quantity in parts of N. and S. America, particularly Chile and Peru. The continued exportation of these nitrates gave rise to the apprehension that they would quickly become exhausted, and Sir Wm. Crookes predicted that this would happen in about 100 years. It therefore became of supreme importance that some technical method should be worked out for the solution of the problem. In wartime it is of obvious significance that a country must be capable of producing sufficient supplies of N. compounds such as nitric acid, if it is to be inde-

pendent of outside help. Indeed it is often said that the Germans did not declare war in 1914 until they had perfected their method of making N. compounds from the air (see NITROGEN, FIXATION OF). Whatever the truth of the matter, Germany was in a position to be independent of outside supplies of nitrates when that war commenced.

N. is usually obtained from the atmosphere by removing the oxygen. This may be done by passing a current of air over copper heated to redness, by burning phosphorus in a confined volume of air, or by the action of an alkaline solution of pyrogallol on air. It may also be prepared by passing a current of chlorine through excess of ammonium hydroxide, or by heating ammonium nitrite or a mixture of ammonium chloride and sodium nitrite. But perhaps one of the soundest methods is by the fractional distillation of liquid air. The gas obtained by removing the oxygen from atmospheric air contains argon and small quantities of other gases besides N. All of these gases are so inert chemically that they can only be separated with difficulty. Chemically N. is inert, on the whole, but it will combine with magnesium to form a nitride, and with calcium. In 1910 Strutt demonstrated that an electric discharge from Leyden jars acted upon a low pressure current of N. in such a way as to produce a continuance of the glow after the gas had passed the region of the discharge. The active nitrogen produced in the change is capable of bringing about various changes which ordinary N. cannot do. It combines with nitric oxide to form N. peroxide, with mercury to give a nitride, and it possibly consists of single atoms. All attempts to liquefy it have failed. This luminous gas also converts ordinary phosphorus into red phosphorus, while sodium and mercury combine with the gas when heated within it.

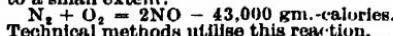
Compounds.—N. forms with oxygen five oxides: nitrous oxide (N_2O), nitric oxide (NO), N. trioxide (N_2O_3), N. dioxide (N_2O_4), and N. pentoxide (N_2O_5). Nitrous oxide (N_2O), or 'laughing gas,' is prepared by heating ammonium nitrate. The oxide is a colourless gas with a pleasant odour and taste. It condenses at 15°C . under a pressure of 40 atmospheres. It is soluble in water, is easily decomposed by heat, and resembles oxygen in supporting combustion, but it can be distinguished from the latter gas by mixing it with nitric oxide, when no brown N. dioxide is formed. It has marked anaesthetic properties, and is used in dental practice to a great extent. There is a corresponding oxyacid, hyponitrous acid ($\text{H}_2\text{N}_2\text{O}_2$), forming salts called hyponitrites, of which the silver salt is most usually prepared. Nitric oxide (NO) is prepared by the action of dilute nitric acid on copper, or by the action of sulphuric acid on a mixture of potassium nitrate and ferrous sulphate. It is a colourless gas which readily combines on admixture with oxygen, forming reddish-brown fumes of N. dioxide. It is only sparingly soluble in water. It can be

converted into a liquid boiling at -153.6° C. and into a solid which melts at -167° C. The gas combines with ferrous sulphate to form an addition product which is easily decomposed by heat. This is the basis of a common test for a nitrate. Thus if a nitrate is dissolved in water and a crystal of ferrous sulphate is added and shaken up until dissolution takes place, then on tilting the tube and gradually pouring in strong sulphuric acid, a brown ring appears at the junction of the two liquids. N. trioxide (N_2O_3) is prepared by decomposing a nitrite with sulphuric acid. It is a very unstable compound, and the gaseous form is probably a mixture of nitric oxide and N. tetroxide. At low temps. it condenses to a blue liquid. It is the anhydride of nitrous acid, which is also an unstable body, readily decomposing into nitric acid and nitric oxide. Nitrous acid forms salts called nitrites, which are all soluble in water, and give off reddish fumes when heated with a warm mineral acid. N. dioxide, or tetroxide (N_2O_4), is formed by the direct combination of nitric oxide with oxygen, and the condensation of the reddish-brown fumes. The liquid is colourless at low temps., but darkens in colour as the temp. rises. The behaviour of this body furnishes a good example of dissociation, a reversible thermal change. Bodies which burn with sufficiently high temps. to decompose the gas will continue to burn in it. Water decomposes N. peroxide with the production of nitrous and nitric acids at low temps., and of nitric acid and nitric oxide at high temps. N. pentoxyde (N_2O_5) is a white crystalline solid obtained by the action of phosphorus pentoxide on nitric acid at a low temp. At 30° C. the crystals melt to form a yellowish liquid which tends to decompose at higher temps. N. pentoxyde is very readily soluble in water forming nitric acid, which forms salts called nitrates. Nitric acid is a colourless, fuming liquid with a powerful oxidising action. It readily chars dry organic matter and attacks metals, forming the nitrates or the oxides. The nitrates are all soluble in water and decompose at high temps. N. forms with hydrogen the compound ammonia (NH_3 , g.r.), which was at one time supposed to be the oxide of a metal ammonium. No such metal exists, however, and the ammonium salts are derived from a radicle (NH_4), which behaves chemically in much the same way as the alkaline metals; sodium, potassium, etc. Hydrazine N_2H_4 is another compound, as is N_2H_4 hydrazole acid. N. trichloride (NCl_3) is obtained by the action of chlorine on ammonium chloride. It is a volatile yellow oil, irritating to the mucous membrane, and is very explosive. Nitrosyl chloride ($NOCl$) is obtained by the combination of nitric acid and chlorine. It is an orange-coloured gas which is readily liquefied. N. sulphide (N_2S) is obtained by the action of ammonia on sulphur chloride. It is an orange-coloured crystalline solid, melting at 178° C. See also CYANAMIDE.

Nitrogen Case Hardening, see NITRIDING.
Nitrogen, Fixation of. Any process

whereby elementary N. is converted into useful N.-containing compounds, particularly those connected with artificial manures, explosives, nitric acid, and ammonia.

(1) Under the action of an electric discharge, N. and oxygen in air combine to a small extent.



Technical methods utilise this reaction.

In the Birkeland-Eyde process (formerly used in countries where electricity is cheap, e.g. Norway), an electric arc passing between water-cooled copper electrodes (alternating current at 5000 volts pressure)



I.C.I.

FIXATION OF NITROGEN: COMPRESSION PLANT OF THE BILLINGHAM AMMONIA SYNTHESIS PROCESS

The compressors shown are of the reciprocating type: those at the right raise the pressure of the gases used for ammonia production to fifty atmospheres, and those on the left complete the compression stage by further raising the gas to 250 atmospheres.

is spread out into a circular sheet of flame by the action of a strong magnetic field. Air is forced into the furnace containing the electrodes, and leaves at a temp. of about 1000° C., after which it is cooled quickly, passes into chambers where the oxidation $2NO + O_2 = 2NO_2$ (about 1-1.5 per cent of air converted) goes on, and thence to granite towers packed with quartz, down which water trickles,



The nitric acid produced is either kept as such, or converted into calcium nitrate. The remaining nitric oxide is largely absorbed in towers containing alkali, but some is lost. In the Pauling process

(Italy and Austria) the hollow, water-cooled electrodes are inclined at right angles, and the sheet of flame spreads up between them, whilst the Schönher process utilises a long arc along which the air streams with a whirling motion. All these methods are now obsolete, having been replaced by (2).

(2) *Ammonia Production.* In the Badische process steam and air are passed over hot coke, and the resulting gases subjected to a catalytic process, whereby carbon monoxide is converted into carbon dioxide. The mixture is compressed in stages to 200 atmospheres (the Claude process uses 1000 atmospheres), and carbon dioxide removed by water, traces of carbon monoxide and poisons being removed later. The pure gas (a mixture of N₂ and hydrogen 1 : 3 by volume) is led into steel converters containing catalysts (e.g. iron) and promoters (e.g. molybdenum) at a temp. of nearly 600° C., when the change goes on

$N_2 + 3H_2 \rightleftharpoons 2NH_3 + 24,000 \text{ gm.-calories}$
to about 8 per cent. The ammonia in the issuing gas is washed and removed, or converted into ammonium sulphate by the action of carbon dioxide and anhydrite suspension. Many details are kept secret. Sometimes electrolytic hydrogen is used.

(3) *Formation of Nitrides, etc.* Serpek's process utilised the action between alumina and coal heated in a current of N. 1800–1900° C.

$Al_2O_3 + 3C + N_2 = 2AlN + 3CO$
with catalysts like copper. Rotating cylinders are employed for the mixing. With water the nitride forms ammonia. Calcium cyanamide (CaCN₂). Calcium carbide (q.v.) made on the spot is finely pulverised, mixed with lime and heated in steel cylinders electrically to 1000° C., when pure N₂, made by the distillation of liquid air is introduced. One ton of N. is fixed by the expenditure of 115 kilowatt-hours. The product is cooled, sprayed with a little water to remove carbide, and is known variously as lime N., calcium cyanamide, nitrolim, kalkstickstoff. It yields ammonia especially when heated with water in an autoclave. Some plants (leguminous) can fix N. directly.

See J. Knox, *Fixation of Atmospheric Nitrogen*, 1921; J. R. Purtington and P. H. Parker, *Nitrogen Industry*, 1922; F. Ernst, *Fixation of Atmospheric Nitrogen*, 1928; T. P. Hilditch, *Catalytic Processes in Industry*, 1929; and T. P. Hilditch and C. C. Hall, *Catalytic Processes in Applied Chemistry*, 1937.

Nitrogen Peroxide, see NITROGEN, Compounds.

Nitro-glycerine ($C_3H_5(ONO_2)_3$) or more correctly 'glyceryl trinitrate' was produced first by Sobredo in 1846 by the action of nitric acid on glycerol. Nobel introduced it into the manuf. of explosives. It is prepared by mixing twelve parts of fuming nitric acid and forcing a spray of four parts of glycerol through the mixture, which is kept cool by a current of air. The mixture is allowed to stand, when the

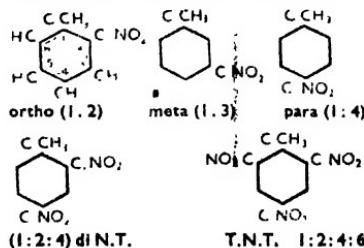
N. forms a layer on the surface. This layer is run off into water, from which it separates as a heavy oil. It is then treated with sodium carbonate to free it from acid, and then dried by filtering through felt covered with a layer of salt. It is a heavy, colourless liquid, which solidifies at 8° C., sp. gr. 1.6. It is very poisonous, and has a sweetish, burning taste. Sometimes it is used in medicine. If touched by a flame it simply burns, but if heated in a confined space it explodes violently. In the form of a liquid there are many dangers associated with the use of N. To obviate these, as well as to increase its explosive force, Nobel invented *dynamite*, in which N. is absorbed in *kieselguhr*, a fine, siliceous earth. The mixture is pressed into cartridges and fired by a detonator. Many other explosives (e.g. blasting gelatine, cordite) are simply made by mixing N. with various absorbent materials. On saponification by means of alkalis it gives rise to glycerol, a fact which indicates its real structure.

Nitrolim, see KALKSTICKSTOFF.

Nitro-sulphuric Acid ($H_2NO(SO_4)$) is obtained as an intermediate product in the commercial manuf. of sulphuric acid. It is produced by the interaction of sulphur dioxide, nitrogen peroxide, and water. It is a white crystalline compound which is decomposed by excess of water, forming sulphuric acid and a mixture of nitric oxide and nitrogen peroxide.

Nitrosyl Chloride, see CULORO-NITROUS GASES.

Nitrotoluenes. The nitration of toluene (q.v.) leads to the formation of a mixture of ortho (1:2) and para (1:4) Ns., $CH_3C_6H_4NO_2$, which can be separated by fractional distillation. The ortho-compound is a liquid which solidifies at -10.5° C. and boils at 218° C., whilst the para-compound is a solid melting at 54° C. and boiling at 234° C. They are both employed in the colour industry. Meta-N. is obtained from propiophenone by converting it first into its acetyl derivative and then nitrating the latter. The resulting meta-nitro-propiophenone on hydrolysis and diazotisation in alcohol yields meta-N., a solid which melts at 16° C. and boils at 230° C. There are a number of dinitrotoluenes, $CH_3C_6H_3(NO_2)_2$, the most important being the (1:2:4) compound obtained by the further nitration of toluene. Trinitrotoluene, or T.N.T., is used as a powerful explosive (q.v.), and is obtained by the nitration of toluene. The formulae of the bodies mentioned are



Nitrous Acid, *see* NITROGEN.

Nitrous Ether, or **Ethyl Nitrite** ($C_2H_5NO_2$), is a colourless liquid (sp. gr. 0.947 at 15°-5°; boiling-point 17° C.) with a pleasant fruity odour like apples. It is usually prepared by distilling a mixture of alcohol and sulphuric acid with copper and nitric acid. It is insoluble in water, is hydrolysed by boiling water and dilute alkalies, and is a component of the 'sweet spirit of nitre' used in medicine.

Nitrous Oxide, *see* LAUGHING GAS; NITROGEN, Compounds.

Nits, *see under* LICE.

Nitti, Francesco Saverio (*b.* 1868), It. politician and economist, was *b.* at Melfi in Potenza. Formerly prof. of science of finance at Naples Univ., he was Liberal deputy from 1904 to 1922, and minister of commerce and agriculture in the Cabinet of Giovanni Giolitti, the Piedmontese bureaucrat, from 1911 to 1914. As a friend of Giolitti he has always shared the latter's unpopularity with the parties of the left, but after the disaster of Caporetto in Oct. 1917, he formed a new gov., with Orlando as Premier, the latter also being a friend of Giolitti, whose governmental machinery, rightly or wrongly, was condemned in 1915. N. was minister of finance in Orlando's gov., 1917-19. Following the victories of Diaz in the First World War, N. became Prime Minister and minister of the interior, 1919-20. After the war he was succeeded by Giolitti, whose return to power has been regarded as a major cause of the national catastrophe of Fascism. N. lived in France throughout the dictatorship of Mussolini, but after the Second World War he returned as a leader of the National Democratic Union. His political sympathies seem to lie between Liberalism and neo-Fascism, hence the almost pathological reaction of the parties of the left when the right, after the war, urged the employment of the ripe experience of such men as N., Orlando, or Bonomi in resolving the country's political confusion, since in the eyes of the left wing parties these ageing statesmen will always bargain some form of Fascism back into authority. In the days immediately preceding the meeting of the Constituent Assembly in 1945-46 the working classes were opposed to N. and other pre-Fascist ministers, and they criticised N.'s financial *modus vivendi* with America, but N. received strong support from Giancini's notorious *L'Uomo Qualunque* ('The Ordinary Man'), which attributed Italy's post-war political difficulties to the Comitato di Liberazione Nazionale political parties and called for an administrative state instead of a political state, by which Giancini meant a state without parties and governed by technical experts like Orlando and N. (See further under ITALY, History.) Pubs. by N. include: *Europa senza pace* (1921); *The Decadence of Europe* (1922); and *L'Inquietude du monde* (1934).

Niue, coral is. in the S. Pacific Ocean, in lat. 19° 10' S. and long. 169° 47' W. It is 14 m. long and 10 m. wide. It was annexed, together with the Cook and other

S. Pacific Is., to New Zealand in 1901. There is a resident commissioner, and laws, etc., are the same as for Cook Is. Straw-plaiting is one of the chief occupations, and hats, bananas, copra, baskets, and kumaras are exported. At Alofi, the seat of the administration and the port of the is., is a wireless station. Area 100 sq. m. Pop. 4300.

Nivelle, Robert George (1856-1924), Fr. general, studied at the Ecole Polytechnique. He commanded the Eleventh Army, later becoming commander-in-chief of the armies of the N., and N.E. A former member of the Conseil Supérieur de la Guerre, in the First World War he first came to the fore at Verdun in 1916. In May 1916 he resisted the efforts of the Giers, to overwhelm Fort Vaux, but ultimately both that fort and Douaumont (*q.v.*) fell. In Oct.-Nov., however, he launched a successful counter-attack on the E. bank of the Meuse, recovering both places, together with Damvillers, though it is commonly stated that the actual operations were conducted by Gen. Mangin (*q.v.*). Later in the same year Joffre was made a marshal of France, and N. was made commander-in-chief in his stead. During the general Ger. withdrawal in March 1917 to the Hindenburg line (*q.v.*) N. conceived the bold plan of a 'decisive blow' and, abjuring the method of attrition, made preparations for a combined assault of all his armies from the Aisne heights from W., S., and S.E., the most ambitious effort since the battle of the Marne of 1914. But he failed utterly, and a strong reaction set in against him, his methods being unfavourably contrasted with the more cautious Fabien strategy of Pétain and Foch (*q.v.*). The result was that the post of chief of the general staff in Paris was revived, and Pétain was appointed to fill it, the step being a mere formality to Pétain's eventual appointment to succeed N. as commander-in-chief of the Fr. armies, while Foch took Pétain's place at the Ministry of War. See F. E. A. Hellot, *Le Commandement des généraux Nivelle et Pétain* 1917.

Nivelles (Plm. Nijvel), city of Belgium, in the prov. of Brabant, 18 m. S. of Brussels. It has important railway works, and manufcts. of paper and iron furniture. There are also steel works, copper foundries and mills. The fine Romanesque church of St. Gertrude, dating from the eleventh century, was heavily damaged in May 1940 when the centre of the city, with about 470 houses, was totally destroyed. Pop. 11,900.

Niven, Frederick John (1878-1944), Scottish writer of poems and songs, novels, and books on Canada, was *b.* at Valparaiso. Educated at Hutcheson's grammar school and Glasgow School of Art. He served in the Ministry of Information during the First World War. His works include *Hands Up* (1913); *Sage-Brush Stories* (1917); *Justice of the Peace* (1922); *Canada West* (1930); *The Paisley Shawl* (1931); *Mrs. Barry* (1933); *Triumph* (1934); *The Maillands* (1939). *Mine Inheritance* (1940); *Prelude to Victory* (1941). One of

his best novels of Canada is *The Flying Years*, a slow-moving story which tells of the development of the W. on the threshold of the twentieth century.

Nivernais, former prov. in the centre of France, nearly coinciding with the modern dept. of Nievre. It was ruled by the counts of Nevers in the Middle Ages, and was created a duchy by Francis I. Its cap. was Nevers, which was included in it to the Merovingian period. The N. canal joins the Yonne and Loire rives., and was constructed in 1784-1842.

Nix and Nixie, in Teutonic mythology, male and female water sprites, for the most part malignant. They were represented as of human form, and frequently mixing with mortals, particularly in music and dancing. See also DEMONOLOGY; NICKER. See K. Heckscher, *Die Volkskunde des germanischen Kulturreises*, 1925.

Nizam, title of the sovereign of Hyderabad.

Nizhni-Tagilsk, see NIJNI-TAGIL.

Nizhniy-Novgorod, see GORKY.

Nizza, see NICE.

N.K.V.D., Narodnij Kommissariat Vnutrennjij Dzjel (People's Commissariat for Internal Affairs), name of the Russian secret police from 1938 to 1945. After the 1917 revolution the tsarist Ochrana was restored by Lenin as the Cheka, which in its turn, in 1923, was reorganised and renamed G.P.U. (Ogpu). This was developed into an elaborate organisation with great influence in many branches of Russian life and society, and its work was continued when, after the 1936-38 purges, it was renamed the N.K.V.D. and put under the control of Lavrenti Beria. After the Second World War the People's Commissariats were renamed ministries, and the N.K.V.D. was divided into the M.V.D. and the M.G.B., both under the ultimate control of Beria, and sharing between them, in proportions impossible to define, the work of the N.K.V.D. See further under M.V.D.

No, or Nu-Amon (Egyptian *nu-aa*, the large city, or *nu-Amen*, Amon's city), city in Egypt known to the Gks. as Thebes, and surviving to modern times in the ruins at Karnak and Luxor. Founded in remote antiquity, N. became prominent when from it sprang the eleventh dynasty; it was less prominent again till the time of the eighteenth dynasty, and thereafter to the twentieth. It was the prin. centre of the worship of Amen, regarded as the equivalent of the Gk. Zeus; hence its name Net-Amen, of which the later Gk. 'Diopolis' was a trans. The more anc. Gk. 'Thebes' seems to have been an adaptation of *Tape*, the 'head' or 'capital.' See further under THEBES.

Noah, son of Lamech, is described in the Book of Genesis as the head of the family that survived the Deluge, and hence as the patriarch of mankind after his time. In Gen. vi.-ix. he is credited with the invention of wine. For the story of the Deluge, see DELUGE.

Noah, the Book of, lost Heb. work which has, however, been largely incorporated into the Ethiopic Book of Enoch and the Book of Jubilees. From these we learn

that it dealt with the birth and life of N. It must not be confused with the late Heb. work of the same name and partly based on it, given in Jelinek's *Bet ha-Midrash*.

Noah's Dove, see COLUMBA NOACHI.

Noailles, name of a noble Fr. family which dates from the eleventh century, the chief members of which are: *Antoine de* (1504-62), appointed admiral of France in 1547, and ambas. to England from 1553 to 1556. *Francois de* (1519-85), a diplomat, a brother of Antoine; was ambas. to Venice, Constantinople, and London. *Anne Jules* (1650-1708), took part in the siege of Maestricht in 1673, persecuted the Protestants in Languedoc, and became marshal of France in 1693. *Louis Antoine* (1651-1729), became archbishop of Paris in 1695, and cardinal in 1700. He opposed the bull 'Unigenitus' in 1713, for which he was expelled from the court, but he accepted it in 1728. *Adrien Maurice* (1678-1766), served in the Sp. war, 1705-1711, in the wars in Germany, and in those in Italy. He was defeated at the battle of Dettingen in 1743, but distinguished himself at Fontenoy in 1745. *Philippe* (1715-1794), became marshal of France, and served in Germany and Flanders. He and his wife, who was nicknamed 'Madame l'Etiquette' by Marie Antoinette, were guillotined. *Louis Marie* (1756-1804), a general and politician. He served under La Fayette in America, and when he was appointed a member of the Military Committee he drew up a plan for the reorganisation of the army. He also proposed that titles should be abolished. He was made brigadier-general in San Domingo, but was killed in an attempt to capture an Eng. ship off Cuba. *Paul* (1802-85), a politician and author, became a member of the Fr. Academ in 1849, and pub. *Histoire de la maison royale de Saint-Louis établie à Saint-Cyr* (1843), and *Histoire de Madame Maintenon et des principaux événements de règne de Louis XIV* (1848). *Jules Charles Viétrinien* (1826-95), an author, wrote works on economics, and contributed to the *Revue des Deux Mondes*.

Noailles, Anna, Comtesse de (1876-1933), Fr. poetess, b. in Paris, on her father's side a Rumanian, a Bibescu, of one of the ruling families of Wallachia; on her mother's side descended from Gk. aristocrats; by her marriage a member of Fr. aristocracy. Her poems are musical, personal, and often exotic and mystical. In 1901, after her marriage, she pub. her first vol. of verses, many of which had been written when she was only sixteen. It was called *Le Cœur innombrable*, had an immediate success, and was crowned by the Fr. Academy. Other well-known books of poems are *L'Ombre des jours* (1903), and *Les Vitrants et les morts* (1913). *L'Honneur de souffrir* was pub. four years after the death, in 1923, of Maurice Barrès, one of her greatest friends. Her autobiography appeared in 1934. See lives by G. A. Masson, 1924; J. Larnac, 1931; and M. Borély, 1939.

Noakhali, dist. of E. Bengal, Pakistan, in the Chittagong div. The cap. is Sud-

haram. The chief exports are rice, betelnuts, linseed, and hides. Area 1644 sq. m. Pop. 1,150,000.

Nobel. Alfred Bernhard (1833-96), Swedish engineer and chemist, was b. at Stockholm. In 1842 he went to St. Petersburg with his family, and studied the construction of torpedoes and marine mines with his father. In 1859 he returned to Sweden and devoted himself to the study of explosives, especially the utilisation of nitro-glycerine. In 1867 he discovered and patented the explosive mixture known as dynamite. A few years later he produced ballistite or smokeless powder. From his various other inventions and discoveries and the exploitation of the Baku oil-fields, he amassed a large fortune. At his death he left the bulk of it in trust for five ann. prizes, to be awarded without distinction of nationality or sex, for eminence in physics, chem., physiology or medicine, literature, and to one who rendered the greatest service to promote international peace. See lives by H. Schuck and It. Sonman, 1933, and Herta E. Pauli, 1948.

Nobel Prizes, prizes awarded, by the Swedish Academy of Science for physics and chem.; by the Stockholm Faculty of Medicine, for medicine, or physiology; by the Swedish Academy of Literature, for literature; and by a committee elected by the Norwegian Legislative Assembly, for peace. The prizes, which amount to about £8000 each, are awarded from the income of a capital sum of £1,750,000 left on trust by the Swedish scientist, Alfred N. (q.v.). This fund is administered by a board of directors chosen by the prize-awarding bodies above noticed, the president of the board being appointed by the Swedish Gov. Undistributed prize money reverts to the main fund or is reserved for each section. Mme Curie is the only case of an award of two prizes to one individual. The following lists show the winners of the various prizes, from 1901 to 1949.

Physics

1901	W. K. Röntgen (German)
1902	H. A. Lorentz and P. Zeeman (Dutch)
1903	H. A. Becquerel (French) and P. and Marie Curie (French, b. in Poland)
1904	Lord Rayleigh (British)
1905	P. Lenard (German)
1906	J. J. Thomson (British)
1907	A. A. Michelson (American)
1908	G. Lippmann (French)
1909	G. Marconi (Italian) and F. Braun (French)
1910	J. D. van der Waals (Dutch)
1911	W. Wien (German)
1912	G. Dalen (Swedish)
1913	H. Kamerlingh-Onnes (Dutch)
1914	M. von Laue (German)
1915	W. H. Bragg and W. L. Bragg (British)
1916	No award
1917	C. G. Barkla (British)
1918	M. Planck (German)
1919	J. Stark (German)

1920	C. E. Guillaum (Swiss)
1921	A. Einstein (German)
1922	N. Bohr (Danish)
1923	R. A. Millikan (American)
1924	K. M. G. Siegbahn (Swedish)
1925	J. Franck and G. Hertz (German)
1926	J. B. Perrin (French)
1927	A. Compton (American) and C. T. R. Wilson (British)
1928	O. W. Richardson (British)
1929	Duc L. V. de Broglie (French)
1930	C. V. Raman (Indian)
1931	No award
1932	W. Heisenberg (German)
1933	P. A. M. Dirac (French) and E. Schrödinger (American)
1934	No award
1935	J. Chadwick (British)
1936	C. D. Anderson (American) and V. F. Hess (Austrian)
1937	C. J. Davisson (American) and G. P. Thomson (British)
1938	E. Fermi (Italian)
1939	E. O. Lawrence (American)
1940-42	No awards
1943	O. Stern (American)
1944	I. I. Rabi (American)
1945	W. Pauli (Austrian)
1946	P. W. Bridgman (American)
1947	Sir E. Appleton (British)
1948	P. M. Blackett (British)
1949	H. Yukawa (Japanese)

Chemistry

1901	J. H. van't Hoff (Dutch)
1902	E. Fischer (German)
1903	S. A. Arrhenius (Swedish)
1904	Sir W. Ramsay (British)
1905	A. von Baeyer (German)
1906	H. Moissan (French)
1907	E. Buchner (German)
1908	E. Rutherford (British)
1909	W. Ostwald (German)
1910	O. Wallach (German)
1911	Marie Curie (French, b. in Poland)
1912	V. Grignard and P. Sabatier (French)
1913	A. Werner (Swiss)
1914	T. W. Richards (American)
1915	R. Willstätter (German)
1916-17	No awards
1918	F. Haber
1919	No award
1920	W. Nernst (German)
1921	F. Soddy (British)
1922	F. W. Aston (British)
1923	F. Prell (Austrian)
1924	No award
1925	R. Zsigmondy (German, b. in Austria)
1926	T. Svedberg (Swedish)
1927	H. Wieland (German)
1928	A. Windaus (German)
1929	A. Harden (British) and H. von Euler Chelpin (Swedish, b. in Germany)
1930	H. Fischer (German)
1931	C. Bosch and F. Bergius (German)
1932	I. Langmuir (American)
1933	No award
1934	H. C. Urey (American)
1935	F. Joliot (French) and his wife Irene Curie (French, b. in Poland)

	<i>Chemistry—continued</i>	
1936	P. J. W. Debye (German, b. in Holland)	1946 1947
1937	W. N. Haworth (British) and P. Karrer (Swiss)	
1938	R. Kuhn (German, declined award)	1948 1949
1939	A. Butenandt (German, declined award) and L. Ruzicka (Swiss)	
1940-42	No awards	
1943	G. Hevesy (Hungarian)	1901
1944	O. Hahn (German)	1902
1945	A. Virtanen (Finnish)	1903
1946	J. B. Sumner, J. H. Northrop, and W. M. Stanley (American)	1904
1947	Sir R. Robinson (British)	1905
1948	A. Tiselius (Swedish)	1906
1949	W. F. Glauque (American)	1907
	<i>Medicine and Physiology</i>	1908
1901	E. A. von Behring (German)	1909
1902	Sir R. Ross (British)	1910
1903	N. R. Finsen (Danish)	1911
1904	I. Pavlov (Russian)	1912
1905	R. Koch (German)	1913
1906	C. Colgi (Italian) and S. Ramon y Cajal (Spanish)	1914
1907	C. L. A. Laveran (French)	1915
1908	F. Ehrlich (German) and E. Metchnikoff (German-French, b. in Russia)	1916
1909	T. Kocher (Swiss)	1917
1910	A. Kossel (German)	1918
1911	A. Gulstrand (Swedish)	1919
1912	A. Carrel (American, b. in France)	1920
1913	C. Richet (French)	1921
1914	R. Barany (Austrian)	1922
1915-18	No awards	1923
1919	J. Bordet (Belgian)	1924
1920	A. Krogh (Danish)	1925
1921	No award	1926
1922	A. V. Hill (British) and O. Meyerhof (German)	1927
1923	F. G. Banting (Canadian) and J. J. R. MacLeod (Canadian)	1928
1924	W. Einthoven (Dutch)	1929
1925	No award	1930
1926	J. Fibiger (Danish)	1931
1927	J. von Wagner-Jauregg (Austrian)	1932
1928	J. C. Nicolle (French)	1933
1929	F. G. Hopkins (British) and C. Eijkman (Dutch)	1934
1930	K. Landsteiner (American, b. in Austria)	1935
1931	O. Warburg (German)	1936
1932	Sir C. S. Sherrington and E. D. Adrian (British)	1937
1933	T. H. Morgan (American)	1938
1934	G. R. Minot, W. P. Murphy, and G. H. Whipple (American)	1939
1935	H. Spemann (German)	1940-43
1936	Sir H. H. Dale (British) and O. Loewi (Austria)	1941
1937	A. von Szent-Györgyi (Hungarian)	1945
1938	C. Heymans (Belgian)	1946
1939	G. Domagk (German)	1947
1940-42	No awards	1948
1943	H. Dam (Danish) and E. A. Doisy (American)	1949
1944	J. Erlanger and H. S. Gasser (American)	
1945	Sir A. Fleming and Sir H. W. Florey (British), and E. B. Chain (German)	

Nobel
H. J. Muller (American)
C. F. Cori and his wife Gerty Cori (American, b. in Czechoslovakia), and B. Houssemey (Argentine)
P. Moeller (Swiss)
W. R. Hess (Swiss) and A. E. Moniz (Portuguese)

Literature

R. F. A. Sully-Prudhomme (French)
T. Mommsen (German)
B. Björnson (Norway)
F. Mistral (French) and F. Echevarría y Eizaguirre (Spanish)
H. Sienkiewicz (Polish)
G. Carducci (Italian)
R. Kipling (British)
R. Eucken (German)
Selma Lagerlöf (Swedish)
P. Heyse (German)
M. Maeterlinck (Belgian)
G. Hauptmann (German)
R. Tagore (Bengali)
No award
R. Rolland (French)
Verner von Heidenstam (Swedish)
K. Gjellerup and H. Pontoppidan (Danish)
No award
C. Spitteler (Swiss)
K. Hamsun (Norwegian)
A. France (French)
J. Benavente (Spanish)
W. B. Yeats (British)
W. Reymont (Polish)
G. B. Shaw (British)
Grazia Deledda (Italian)
H. Bergson (French)
Sigrid Undset (Norwegian)
T. Mann (German)
S. Lewis (American)
E. A. Karlfeldt (Swedish)
J. Galsworthy (British)
I. Bunin (French, b. in Russia)
L. Pirandello (Italian)
No award
E. O'Neill (American)
R. M. du Gard (French)
Pearl Buck (American, b. in China of American parents)
F. E. Sillanpää (Finnish)
No awards
J. V. Jensen (Danish)
Lucila Godoy y Alcayaga (Gabriela Mistral) (Chilean)
H. Hesse (Swiss), b. in Germany
A. F. Gide (French)
T. S. Eliot (British, b. in America)
No award

Peace

H. Durant (Swiss) and F. Passy (French)
E. Ducommun and A. Gobat (Swiss)
Sir W. R. Cremer (British)
Institute of International Law
Baroness von Suttner (Austrian)
T. Roosevelt (American)
E. T. Moneta (Italian) and L. Renault (French)

Peace—continued

1908	K. P. Arnöldson (Swedish), F. Bajer (Danish), and A. M. F. Beernaert (Belgian)
1909	Baron d'Estournelles de Constant (French)
1910	International Peace Bureau (Swiss)
1911	T. M. C. Asser (Dutch) and A. H. Fried (Austrian)
1912	E. Root (American)
1913	H. La Fontaine (Belgian)
1914-16	No awards
1917	International Red Cross of Geneva
1918	No award
1919	W. Wilson (American)
1920	L. Bourgeois (French)
1921	K. H. Branting (Swedish) and G. L. Lange (Norwegian)
1922	F. Nansen (Norwegian)
1923-24	No awards
1925	C. G. Dawes (American) and Sir A. Chamberlain (British)
26	A. Briand (French) and G. Stresemann (German)
1927	L. Quidde (German) and F. Buisson (French)
1928	No award
1929	F. B. Kellogg (American)
1930	Archbishop N. Soderblom (Swedish)
1931	N. M. Butler and Jane Addams (American)
1932	No award
1933	Sir N. Angell (British)
1934	A. Henderson (British)
1935	C. von Ossietzky (German)
1936	C. S. Lamas (Argentine)
1937	Viscount Cecil of Chelwood (British)
1938	Nansen Instructional Office for Refugees, Geneva
1939-43	No awards
1941	International Red Cross of Geneva
1945	C. Hull (American)
1946	J. R. Mott and Emily G. Balch (American)
1947	American Friends' Service Committee (Quakers) and Friends' Service Council, London
1948	No award
1949	Lord Boyd Orr (British)

Nobile, Umberto (*b.* 1885). It. aviator and aeronautical engineer, was *b.* at Avellino. He became director of the dept. for aeronautical design and designed the dirigible *Norge* which made the successful Rome-Alaska trans-Polar flight in the Amundsen-Ellsworth-H-N. expedition of 1926. N. led the *Italia* airship expedition which flew to the North Pole but was wrecked off North East Land, and rescued by a Russian ice-breaker (1928). Appointed deputy chief of Soviet airship construction, by permission of the It. Gov., he was recalled in 1931. He was appointed prof. of aeronautical construction at Naples Univ., and became a member of the Pontifical Academy of Sciences. He wrote *L'Italia al Polo Nord* (1930). See F. Behounek, *Sieben Wochen auf der Eissscholle*, 1929.

Nobile Officium, term in Scots law which is practically equivalent to the Eng. equity. The Inner House alone exercises the jurisdiction except in cases where petitions are required by statute to be presented to the junior Lord Ordinary. Instances of its exercise are: (1) Petitions for the custody of children; (2) applications to settle schemes for the administration of charitable trusts; (3) applications to supply omissions in deeds. See Erskine, *Principles of the Law of Scotland*, 1895, and J. Bell, *Dictionary and Digest of the Law of Scotland*.

Nobility. It is difficult to define N., because the term connotes different qualities and privileges with different nations, and even with the same nation at different periods. N. does not necessarily imply titles, though at the present day it would be a violation of conventional ideas to speak of any one as a noble who had no title, e.g. Article I. of the U.S.A. Constitution contains a provision against the grant of any title of N. The Eng. baronial N. differed in important essentials from the N. of the Continent, whether of France, Germany, or the medieval republic of Venice. Stubbs points out (*Constitutional History*) that 'the great peculiarity of the baronial estate in England, as compared with the Continent, is the absence of caste,' because in the Eng. system 'the theory of nobility of blood as conveying political privilege has no legal recognition.' This dictum, however, must be understood with the important reservation that Eng. peerages may become extinct or fall into abeyance, but so long as there is an heir to the title that heir is *ipso facto* an hereditary counsellor of the Crown or member of the House of Lords. The only difference, therefore, between the Eng. and the continental theory is that, whereas in the former one member only (the eldest son or next heir) of a family is noble in the sense of being a member of the peerage and an hereditary counsellor, in the latter the whole kin of certain families enjoyed political privileges from the fact of descent from an oligarchic aristocracy, and were therefore accounted noble.

History.—Though political privilege is the mainspring of N., a brief survey of the three types of N., classic or anc., medieval, and modern, will reveal striking differences of origin and development. The types to be discussed are the patriciate of anc. Rome, the aristocracy of Greece, the N. of the Venetian republic, and the feudal aristocracy of England and their modern representatives.

The early Rom. patriciate, which was synonymous with the *populus* or original people of Rome, was based upon an eponymous ancestry (Romulus, founder of Rome) and upon the fact that the privileged members of the *gens* were descendants of those who first occupied the hills of anc. Rome. Later, when it was shorn of its political privileges, the patriciate retained its spiritual or religious significance, because none but the members of a clan or *gens* could participate in the *sacra* proper to the *gens*, and because from very early in the hist. of Rome certain

offices like those of the *flamens* (*q.v.*) always went to a patrician.

If any sort of generalisation be possible in the social distinction of a state so full of contradictions and seeming anomalies as ancient Athens, it is that the Athenian N. of the period prior to the Dorian invasion furnished a close parallel to the Roman *populus*, being tribal in its genesis, and claiming precedence from an original occupancy of the soil; but that thereafter, in the heyday of the *demos*, when the *aristoi* had lost all their political privileges, there was no N. in the true sense at all. But when the Dorians conquered the Peloponnesus, there was an influx of wealthy families and noble immigrant families like the Pisistratidae and Alcmaeonidae outshone the old Athenian tribal N. in the eyes of the common people and from that time the old military N. of Athens gave place to an aristocracy of wealth.

The hereditary N. of the republic or signory of Venice traced its origin to no original occupancy, nor boasted a descent from a common founder of the race as distinct from past holders of office. The N. of Venice sprang conclusively from a commercial plutocracy and gradually usurped and retained all the political power in the republic until the Church vindicated the rights of the lesser orders (*see also MUNICIPALITIES*).

The Eng. N. of the Conquest and the Middle Ages was essentially feudal and military, and based upon the solid foundations of landed estates. Like that of the feudal N. of the Normans and Gers., its origin is to be sought in the personal relationship of lord and vassal, and in the system of commendation by which the lord, in return for the allegiance and personal services (generally military or incidental thereto) of his vassal, gave or 'loaned' him land and guaranteed a reciprocal protection. The modern N. of England resembles the old feudal N. in no other respect now than in the fact that it may possess landed estates; but for the rest the Brit. N. consists of a heterogeneous body of peers, some with patents entitling them to sit in the Upper House and some without, and baronets and knights, the great majority of whom possess titles of recent creation, awarded for political or other public services. Only a few of the existing Eng. peerages go back before the time of Wm. Pitt the younger, who himself created over one hundred.

Theory of Nobility.—The theory of N. is biological, and based on the principle that selected stocks should be given opportunity and encouragement to develop and reproduce those qualities which are (a) most desirable in the higher administrative spheres; (b) difficult to acquire without leisure and economic independence; (c) lost again in a few generations of unfavourable environment.

In England emphasis is laid on lineal descent joined to wealth, and intensified environmental training in public schools.

In Scotland and on the Continent less importance has been attached to the environment factor and more to matrimonial discrimination, or 'proof of

nobility' (*preuves de noblesse*), i.e. 'sixteen quartierings' (sixteen great-great-grandparents, or eight great-grandparents) of the individual. The continental N. has always tried to maintain itself as a privileged caste, which has brought it into conflict with the bourgeoisie and proletariat. The Eng. system has been to maintain the peers and their immediate children as a high N. and to sink their junior descendants into a middle class.' The Scottish system also has been to sink the junior members of its N. into the mass of the people; but to encourage even the poorest to retain their pride of race and sense of kinship to the chief or chieftain, whilst titles, etc., are regarded as reflecting credit, not merely on the holder, but on the whole clan.

British Nobility.—The term is used in two senses: (1) The 'gentle' classes, true equivalent of the continental noblesse, in which knights and baronets, and indeed younger children of peers, are included. In Britain, as on the Continent, the 'proof' of N. (*anglice 'gentility'*) is lawful possession of armorial bearings, or paternal descent from an ancestor whom the Crown has either 'ennobled' by such a grant or recognised as already noble (*ur-adel* on the Continent). In England Henry V. definitely laid down that arms are 'tokens of nobility.' In Scotland non-nobles are prohibited by statute from bearing arms, but may be ennobled by grants of same; (2) N. in a restricted sense is applied to peers and their wives (sometimes children), who are equivalent to the *hoch adel* of the Continent. This peerage, or 'high nobility,' consists of the peerages of England and Scotland (created before 1707), of Ireland (created before 1800), and of Great Britain (1707-1800) and of the United Kingdom (since 1800). Each series consists of five degrees, (1) Duke, (2) Marquess, (3) Earl, (4) Viscount, (5) Baron, who differ in rank, but not as to privileges, except that peers of Scotland and Ireland elect sixteen and twenty-eight representatives of their order who, along with all peers of England, Great Britain, and the United Kingdom, form the 'Lords Temporal' of Parliament. The two archbishops and older bishops of the Church of England form the 'Lords Spiritual.' Unlected Scots and Irish peers, and peeresses in their own right, are members of the peerage, but not 'Lords of Parliament.' All peerages are hereditary (usually descending to the heir male of the body of the grantee) except the 'Law Life Peers' or Lords of Appeal, distinguished lawyers raised to the peerage for life to act as judges in the House of Lords.

A dukedom is the first grade of N., but archbishops, the moderator of the Church of Scotland, the Prime Minister, as such, and certain officers of state (including the Lord Chancellor) have precedence. 'Duke' is derived from *duz*, which among Saxons and Romans meant leader of an army. Being the highest dignity at the Crown's disposal, dukedoms have always been sparingly granted. Apparently the whole order became extinct in the reign of Elizabeth, but was revived by James I.,

who ennobled his favourite, George Villiers, as the duke of Buckingham. Many of the present dukes are princes of the blood royal. Marquisates, too, exhibit a like conservatism in numbers. Now (and in Britain always), a mere title of honour, it originally denoted those great barons of the empire who held fiefs on the *marches* or borders. *Earls* are created comparatively often; the term 'earl' (or 'jarl,' a Dan. title which about the time of Ethelred began to supersede that of 'ealdorman,' the chief magistrate of the shire in A.-S. times) denoted the head of a shire. The expression 'belted earl' arises from the mode of investiture of an earl, a belt with sword being buckled round the waist. The next degree, 'viscount,' is derived from *vicecomes*, i.e. the sheriff who presided in the co. court. Barons form the lowest grade of peers; anciently, they were those churchmen or laymen who held land of the king *per baroniam*, i.e. held by honourable service as feudatories of a prince; this still constitutes 'barony' and confers certain privileges in Scotland, without constituting a peerage). Baron or lord-baron is the most general title of N. in England. It was early decided that the fact of holding *per baroniam* did not necessarily give the right to be summoned by writ to the House of Lords. In Scotland the 'minor barons' were exempted from attendance in 1887, whilst the 'greater barons' remained as peers. Peers are created: (1) By writ of summons. Such peerages are not complete until the person honoured takes his seat in the House of Lords, when the title becomes hereditary. (2) By letters patent, which specify the line of descent of the dignity, and the heir specified in the patent succeeds even though the grantee die before taking his seat. Peeresses in their own right who marry commoners retain their titles, but peeresses by marriage lose their titles by remarriage.

See T. Mommsen, *History of Rome*, 1853-56; J. Selden, *Title of Honour*, 1672; E. P. Shirley, *Noble and Gentle Men*, 1860; M. Geizar, *Die Nobilität der römische Republik*, 1912; and Burke, *Peerage*.

Noble, Sir Andrew (1831-1915), Brit. armament-maker, was b. at Greenock, son of George N., naval officer. He was educated at Edinburgh Academy and Royal Military Academy, Woolwich. Assistant-Inspector of Artillery, 1859, in 1860 he assumed the direction of the ordnance dept. of Sir Wm. Armstrong's works at Elswick, becoming its chairman from 1900. He was awarded the Royal Society's gold medal in 1880.

Noble, Sir Percy Lockhart Harnam (b. 1880), Brit. admiral, entered the navy 1894 and served with the grand fleet, 1914-1919; being captain, 1918; rear-admiral, 1929; vice-admiral, 1935. Rear-admiral commanding the second cruiser squadron, 1932-34, he became fourth sea lord and chief of supplies and transport, 1935-37; commander-in-chief, China station, 1938-1940; admiral, 1939; commander-in-chief, W. approaches in Britain, 1941; and head of the Brit. Admiralty delegation to Washington, 1942-43.

Noble, anct. Eng. gold coin, first minted by Edward III. in 1344. Its original value was 6s. 8d., but, it having increased to 10s. owing to the depreciation of silver, a new coin, called an angel (q.v.), of the former value of a N., was issued by Henry VI. On one side of the N. was stamped a ship to commemorate the victory of Sluys.

Noble Gases, see RARE GASES.

Noblesville, cap. of Hamilton co., Indiana, U.S.A., on the White R., 21 m. N.N.E. of Indianapolis; it has manufs. of carriages, iron goods, etc. Pop. 5500.

Noce Dam, in the It. prov. of Trento, across the R. Noce, was begun in 1939. A lake 5 m. in length is formed by 460-ft.-long barrier. Hydro-electric power to the amount of 250,000,000 kw. is supplied for industrial use.

Nocera Inferiore, or *Nocera dei Pagani* (anc. Nuceria), tn. of Campania, Italy, in the prov. and 8 m. N.W. of the city of Salerno, on the R. Sarno. It is the seat of a bishopric, and in the neighbourhood are the ruins of a medieval castle. There are manuf. of textiles. Pop. (com.) 33,800.

Noctiluca, genus of marine flagellate infusorians, about the size of a small pin-head, found in all seas. They are the cause of phosphorescence, a bluish or greenish light being intermittently produced from numerous minute points in the living matter, probably due to a rapid fermentation. The N. moves by using a lash, or flagellum, in whip-like action.

Noctilucent Clouds (luminous night clouds), very rare clouds which are only recognised after dusk because the sun is still shining at their exceptionally great height (about 80 km.). Usually observed about midnight in N. European latitudes just after the summer solstice they resemble cirrus and have a bluish-white to yellowish colour. Other very high clouds seen after dark are known as *mother-of-pearl clouds*. Lower in average height, they are roughly lenticular in shape with beautiful irisation, whence their name. Prof. H. Mohn first recorded observations of these clouds, mainly from Oslo, but most observations have been made by Prof. Carl Störmer, who pub. coloured photographs of them in *Weather* (vol. 3, Jan. 1948). Mr. G. A. Clarke saw them from Aberdeen on Feb. 6, 1934; but in many years they have not been seen at all. Since 1926, by comparing photographs of the clouds as seen from different places against the stars the heights have been found to vary between 20 and 30 km.—well into the stratosphere. From the size of a large lunar corona seen in 1932, and from the position and colours of the irisation the cloud droplets are estimated to be spherical with diameters from 1/1000 to 1/400 mm., the larger drops being towards the centre of the cloud, and the probable temp. about -70° C.

Nocturn, div. of the night office in the Rom. and other breviaries. Each N. in the present Rom. breviary consists of three psalms and three lessons with their antiphons. The night office was, during the Middle Ages, said in the morning, whence its name of matins, but it is now

generally said by anticipation on the previous evening.

Nocturne, 'night piece' or instrumental serenade, generally of a quiet, lyrical character, but sometimes (as in Chopin) with a more agitated middle section. As a pianoforte piece it originated, not with Chopin, but with John Field (1782-1837), but it existed already as the It. *notturno* in the eighteenth century, when however it was similar to the Serenade or Divertimento in several movements. The N. in the modern sense is not necessarily slow, soft, and sentimental. Even Field's are not all so, and one is in the curious form of a vocal operatic scene; Chopin's may have agitated middle sections; Debussy's *Fêtes* is a very animated piece; in Vaughan Williams's *London Symphony* the scherzo



CHARLES NODIER

is a N., i.e. a piece suggesting London's gaiety by night.

Nodes. The N. of a planet or any other celestial body are those two points where its orbit is cut by a fixed plane; in the case of the solar system, by the ecliptic. The straight line which joins these points is called the line of N. The point at which the orbit of a planet passes from S. of the ecliptic to N. of it is known as the ascending node, the other and opposite point necessarily being the descending node. The long. of the ascending N. is one of the six 'elements' by which the movements of a celestial body are determined. Owing to the mutual attractions of the planets, the line of N. is continually shifting; alternately advancing and receding. The retrogression of planetary N. never exceeds one degree per century, but owing to the great attraction of the sun the lunar N. complete a revolution in about eighteen years and seven months. The cycle, known as the *Saros*, was discovered by the Babylonian astronomers who observed that the eclipses of the sun and moon recurred in the same order in each cycle, which is 18 years 11 days.

Nodier, Charles (1780-1844), Fr. author,

b. at Besançon. In 1824 he became librarian at the Bibliothèque de l'Arsenal; in 1833 he was elected to the Academy, and in 1843 made a member of the Legion of Honour. He was the centre of the early members of the Romantic school; Hugo, de Musset, and Sainte-Beuve all acknowledged his influence. His best work consists of his fantastic short stories, among which are *Smarra* (1821); *Triby* (1822); *Histoire du roi de Bohême et de ses sept châteaux* (1830); *La Fée aux miettes* (1832); and *Îles de las Sierras* (1838). See Prosper Mérimée, *Portraits historiques et littéraires*, 1874; also lives of F. Wey, 1844; and M. Henry-Rosier, 1931.

Nodules, see ROOT TUBERCLES.

Noel, Conrad le Despenser (1869-1942), Eng. clergyman and socialist. He was son of Roden N., poet. Educated at Corpus Christi College, Cambridge, and at the Chichester Theological College, he worked for some years among the poor of Portsmouth. As vicar of Thaxted from 1910 to 1942 N. was nicknamed the 'red priest' on account of his Socialist views and the red flag he flew from his church; he was a prominent member of the Christian Socialist movement. He lectured to Socialist groups and wrote a number of religious and political works, including *The Labour Party* (1906); *Socialism and Church History* (1910); *Byways of Belief* (1912); *Uplifting the Son of Man* (1919); *Life of Jesus* (1937); and *Jesus the Heretic* (1939). His unfinished autobiography was pub. in 1946.

Noetus (c. A.D. 130-c. 200), native of Smyrna, he became a leader of that branch of the Christian Church which embraced the doctrine called *patria-passianism*. He was a presbyter of the Church of Asia Minor, but his views led to his excommunication. His contemporary, Hippolytus, in his pub. *Sermon against the heresy of a certain Noetus*, is the authority for his doctrines, which his disciple, Epigonus, preached at Rome.

Nogales, twin city of Morelia, Mexico, situated on the frontier line, one half in Mexico and the other in Arizona. It stands at an altitude of 4000 ft. above sea level, and it is here that the S. Pacific Railroad of America connects with the S. Pacific Railroad of Mexico. The main industries in the dist. are mining and cattle ranching. Pop. 14,000.

Nogent-sur-Marne, tn. in the dept. of Seine, France, on the r. b. of the Marne, 6 ms E. of Paris. There are important chemical manuf. and pottery works. Pop. 21,500.

Nogi, Marasuke, Count (1849-1912), Jap. soldier, b. at Yamaguchi of a Samurai family, saw his first military service in the civil war of 1877, in which the Samurai were finally defeated (see JAPAN, History). He commanded a brigade in the war against China in 1894, and in the Russo-Jap. war (1904-5) he commanded the Third Army. It was N. who forced Port Arthur to surrender and it was his army's flank march which resulted in the signal and decisive Jap. victory in the battle of Mukden (Feb. 20-March 10, 1905). Together with his wife he committed

'honourable suicide' (*hara-kiri q.v.*), according to the old-established custom, on the death of the mikado, Mutsuhito.

Noguchi, Hideyo (1876–1928), Japanese bacteriologist and pathologist, b. in N. Japan, entered the laboratory of pathology of Pennsylvania Univ. He made researches into immunity against snake poisons and in 1904 pub. *The Action of Snake Venom upon cold-blooded Animals*. In the Rockefeller Institute he did valuable work on the aetiology of syphilitic diseases and paresis; he also studied the aetiology of trachoma (*q.v.*) and yellow fever, of which latter disease he d. when conducting investigations in Brit. W. Africa.

Noguès, Auguste (b. 1876), Fr. soldier, b. in the Haute-Pyrénées, was educated at the Ecole Polytechnique and was an artillery captain in the First World War. After the war he served against the Rifs (see AHD-EL-KRIM), 1924–26. Appointed resident-general of Morocco in 1936, and commander-in-chief in N. Africa in 1939, he retained these posts during the Vichy régime. In 1940 he informed the Axis countries and Franco that he would not surrender N. Africa to any invader, even if he were ordered by Pétain to do so. After the landing of the Anglo-American armies in N. Africa and the assassination of Darlan's (*q.v.*) Fr. imperial council and deputy high commissioner for N. Africa, 1942–43. Early in 1943 he declared that he could not understand his unpopularity with the Amers., averring that he was justified in opposing the allied invasion. On June 4, 1943, N., condemned by Gen. de Gaulle as a collaborator with Vichy, submitted his resignation as governor-general.

Noh Plays, see DRAMA, Japanese Drama.

Noisy-le-Sec, tn. in the dept. of Seine, France, near the Ourcq Canal. Pop. 16,300.

Nokrashy Pasha, Mahmud Fahmy El (1888–1948), Egyptian statesman, b. in Alexandria, was educated at the Higher Training College, Cairo, and at Nottingham Univ. College. He entered the teaching profession and, from 1914 to 1919, was headmaster of Gunnalia School, Cairo. After a year as a prov. director of education, he entered the service of the Ministry of Education and soon earned promotion to the post of assistant secretary-general thereof. N. took part in the national agitation for independence and organised sub-committees of the Wafdist movement in Cairo and Alexandria. He became sub-governor of Cairo in 1924 and then under-secretary for the interior. After the murder of Sirdar Lee Stack he was arrested and charged with others with complicity in a number of political crimes, but was acquitted. His first ministerial portfolio was that of communications to the first Wafdist Cabinet in 1930, a post he again occupied in 1936–1937. This proved the turning-point of his career for, in 1937, following the Montreux conference which ended capitulations, he was unexpectedly excluded from the Wafdist Gov. through disagreement with the Wafdist leader over the Blue

Shirt organisation. Soon after this N., with Ahmed Maher Pasha and their respective followers, resigned from the Wafdist to form the Saadist party, pledged to uphold the true principles of Saad Zaghlul Pasha. In 1938, when the Saadists joined the Coalition Gov., N. became minister of the interior; in 1939 minister of education; then for the interior again, and, in 1940, minister of finance. In 1945 he succeeded to the premiership and leadership of the Saadist party, following the assassination of Ahmed Maher. Apart from a short period in 1946, when Sidky Pasha (*q.v.*) was Premier, N. was head of the gov. until his assassination on Dec. 28, 1948, besides holding the portfolios of the interior, finance, and foreign affairs. N. was responsible for breaking off the treaty negotiations with Britain and headed the Egyptian delegation to the Security Council of the United Nations (1947). He enjoyed the reputation of being a first-class administrator and was respected by all parties for his integrity.

Nola, city and episcopal see of Caserta, Italy, 163 m. E.N.E. of Naples. There are remains of a fourth-century church. Giordano Bruno was b. here. Pop. 18,400.

Noldeke, Theodor (1836–1930), German orientalist, b. at Harburg. His first work was a lust. of the Koran (1859), which won the prize of the Fr. Académie des Inscriptions, and which he rewrote in Ger. as *Geschichte des Korans* (1860). In 1861 he lectured at Göttingen; in 1868 he was prof. at Kiel, and from 1872 at 1908 prof. of oriental languages at Strasburg. His works include *Das Leben Mohammeds* (1863); *Die Altestamentliche Literatur* (1868); *Geschichte der Perser und Araber zur Zeit der Susaniden* (1879); *Persische Historien* (1888–92); *Sketches from Eastern History* (Eng. trans., 1892); and *Syriac Grammar*, (Eng. trans., 1904). See E. Kuhn, *Übersicht der Schriften Theodor Noldekes*, 1907.

Nollekens, Joseph (1737–1823), English sculptor, b. in Soho. In 1760 he went to study in Rome, where Garrick met him and commissioned him to execute a bust. This was so successful that Sterne sat to him. He increased his income by buying and selling antiques, and by stock exchange speculation, and was so successful that at his death he was worth £200,000. He returned to England in 1770, and was soon the fashionable sculptor of the day. See G. W. Stonier (ed.), *Nollekens and his Times* (by J. T. Smith, 1828), 1948, and P. Colson, *Private Portraits*, 1949.

Nolle Prosequi, in legal practice an entry in the record of a court which indicates that the crown, in a criminal prosecution, desires to proceed no further with the case. Formerly the practice in entering a N. P. applied both to civil and criminal suits, but is now restricted to the stay of proceedings by indictment or information entered by the attorney-general. In criminal cases when an indictment (*q.v.*) has been found (see JURY), proceedings on it can only be stopped by the Crown entering a N. P. against one or all of the defendants. It can only be entered on

the flat (*q.v.*) of the attorney-general or solicitor-general.

Nomad (Gk. *νομάς*, *νομάδος*—*νέμειν*, to pasture—roaming, especially in search of pasture), member of a race, tribe, or community, who have no fixed abode, but whose chief occupation is the tending of flocks and herds and who wander about, shifting their location according to the state of pasture, and living in tents on grassland or steppe. The Bedouins or desert-dwellers offer the most characteristic example of Ns., and they even claim to be descended from Ishmael. The Bedouins are found mostly in Arabia or other Middle E. countries such as Iraq and Egypt, have a tribal organisation under sheikhs, tend herds of camels or goats and flocks of sheep and are good horsemen (see BEDOUINS). Other examples are the Australian blackfellows and S. African bushmen (*q.v.*) who derive their subsistence from hunting. Gypsy van-dwellers may also be said to lead a nomadic life (see GYPSIES). Among the Hamitic tribes of E. Africa the Galla (*q.v.*) and Borana, the Masai (*q.v.*) and Turkana, all cattle-owning people, are still nomadic; but the Nandi and Suk of Kenya, with the Teso of N. Uganda, now live in settled vls. and practise agriculture. See Sir H. H. Johnston, *The Uganda Protectorate*, 1902; W. Elhardt, *Die Kulturform des Nomadismus*, 1923; and P. G. Merner, *Das Nomadentum in Nordwestafrika*, 1937.

No Man's Land, the name applied to outlying dists. in various countries. It has been used especially to designate the following: (1) Region N. of Texas (Public Land Strip), ceded to U.S.A. in 1850, constituting Beaver co., Oklahoma, since 1890; (2) Narrow dist. between Delaware and Pennsylvania; (3) Small is. 3 m. S.W. of Martha's Vineyard, Massachusetts, to which it belongs; (4) Region corresponding to what is now Griqualand E., Cape of Good Hope; (5) Tract of S. Australia, 80,000 sq. m. in area. (6) Battle zone between opposing front-line trenches in the First World War. It was also used as the name of a storage place on eighteenth-century ships.

Nome, term used for a territorial div. of anct. Egypt, and for a prov. of modern Greece.

Nome, tn. on the S. of the Seward peninsula, N.W. Alaska, on the N. shore of Norton Sound, 13 m. W. of Cape Nome. It is the cent. of a great gold-mining dist., discovered in 1899. Pop. 1200.

Nom-de-plume, see PSEUDONYM.

Nomenclature, see NAMES.

Nominalism, as opposed to *Realism*, was one of the two doctrines of the Middle Ages. The two views of *Nominalism* and *Realism* were opposite, and arose from a consideration of the nature of species and genera. N. implies a belief in the theory that 'universals,' i.e. genera and species, are only names which express the term of qualities expressed. Nominalists, therefore, held the view that nothing was general but *names*. The Nominalists, as opposed to the Realists who, with Plato, declare that class terms are real, more real than the individual things which come

under them, take up the cause of common sense, denying that the concept, or class, has an existence of its own beyond the individuals which make up the class. A narrower form of N. held that even concepts or ideas are not really general.

Roscelin in the eleventh century was a great nominalist, but he brought N. under the ban of the church as a heresy by arriving at a tri-theistic doctrine of the Trinity. From then on N. was held to be heretical and rational. Abelard was a conceptualist (*q.v.*), but his conceptualism swayed really to N. and was also condemned by the Church. Later in the fourteenth century William of Occam upheld N., and among more modern philosophers Hobbes and Berkeley may be mentioned as upholders of modified forms of the doctrine.

Neither Realist nor Nominalist had the insight for bringing out the real truth of Plato's doctrine, and extricating it from its connection with the reality of the *abstract* universal. N. was the natural ally of the scientific spirit, even if this were not consciously present in the minds of the earlier Nominalists, and science is incompatible with an exclusive interest in personal salvation; hence N. was bound to conflict with the whole principle of dogmatism. The earlier N. failed, however, because the age was still in need of the unifying authority of the Church, and Realism had been the philosophical justification of that authority. N. had a revival in the time of William of Occam and the reason for this was that the period of authority was past, and that the period of individualism was at hand, which was to lay the foundations for modern progress. N., by its insistence upon the reality of particular things, justified the growing scientific spirit in its attention to facts rather than to *a priori* dogmas. It justified the revolt of individuals against the stereotyped generalisations of the past, and of nations against the abolition of the Catholic Church. At its revival, therefore, it was no longer opposed to the needs of the age, but in harmony with them, and its ultimate victory was assured. See also CONCEPTUALISM; REALISM; SCHOLASTICISM. See A. Rogers, *History of Philosophy*, 1921.

Nonæ, or **The Nones**, in the Rom. calendar the fifth day of all months except March, May, July, Oct.

'March, July, October, May
Make Nones the 7th, Ides the 15th, day.'

It was so called because falling on the ninth (nonus) day (reckoning inclusively) before the Ides, and marked the moon's first quarter. Cf. *Kaleudia*, Ides. See Smith's or Harper's *Dictionary of Classical Antiquities* under *Calendarium*.

Non-Commissioned Officers, see RANK.

Nonconformity, refusal to conform to the doctrines and discipline of an estab. church and generally meaning the N. of Protestant dissenters. In the seventeenth century the word signified the practice of those who, while remaining within the bounds of the Church, yet refused to conform to certain ceremonial practices,

such as the wearing of the surplice, the sign of the cross in baptism, and the use of the ring in marriage. The rise of N. in the present meaning of the term dates from the period immediately following on the Reformation. The last secession took place in 1563, but Puritan violence turned the anger of the state against them, and during the reign of Elizabeth they were persecuted. On the accession of James I., who had been brought up among Presbyterians in Scotland, they expected more favourable treatment, but the issue of the Hampton Court Conference speedily convinced them to the contrary. Owing to the identification of king and bishop, the misgovernment of the king brought odium upon the Church as well as upon the throne, and when, therefore, recourse was had to arms, the resentment of the Parliament was directed against the Church as well as against the royal prerogatives, and the death of Laud soon followed that of his king. The supremacy of Parliament was marked by a vigorous attack on Episcopacy, at first in the interests of Presbyterianism but later in those of Independency. In 1643 the Westminster Assembly adopted the Solemn League and Covenant, which included an article for the abolition of prelacy. But the reaction which followed against the political system of the Commonwealth was directed also against Puritanism. Hence the Restoration of 1660 was followed by the passing of a body of legislation directed against Nonconformists. The Act of Uniformity (1662) was an attempt to remove from eccles. benefices those Puritan ministers who had been intruded during the Commonwealth period. It obliged all those who had not received episcopal ordination to do so, and rather than submit to this a large number of ministers, of whom the number has been variously estimated, quitted their benefices. Other Acts of the Clarendon Code were directed to the repression of N. outside the bounds of the Church, such as the Conventicle Act (1664), which laid penalties upon all attending dissenting conventicles, and the Five Mile Act (1665), which forbade Puritan ministers when travelling to come within 5 m. of a corporate tn. The Test Act (1673), though directed principally against Rom. Catholics, also pressed hard upon Protestant dissenters; and no satisfaction was felt by them at James II.'s Declarations of Indulgence (1687-88), for these, too, were obviously intended for the relief of Rom. Catholics. A change came with the accession of William and Mary, and the Toleration Act of 1689 removed most of the disabilities imposed by the Clarendon Code, though the Corporation Act and the Test Act remained in force until 1828.

In 1730 some attempt at combined action among the Nonconformist bodies was made by the non-corporate union of the three denominations, Baptists, Independents, and Presbyterians. Outside this union the chief dissenting bodies were at this time the Quakers and the Unitarians. But by 1760 another important body was added to them on the secession

of the Methodists from the Estab. Church. The repeal of the Corporation and Test Acts took place in 1828; in 1836 marriage in a dissenting chapel was made legally valid; in 1871 an Act was passed opening the univs. to non-members of the Church of England; in 1880 Nonconformist ministers were allowed to conduct funerals in the par. burying grounds. A great step in the direction of union between the various bodies was the estab. in 1892 of the National Council of the Evangelical Free Churches. A union of Methodist Churches took place in 1932 when the United Methodists combined with the Wesleyan Methodists and Primitive Methodists to form the Methodist Church. See also HYMNS. *Nonconformist Hymnody*. For bibliography see under BAPTISTS, METHODISM, and other denominations.

Non-contributory Pensions, see under NATIONAL INSURANCE ACT (1946).

Non-co-operation, see PASSIVE RESISTANCE.

Nonesuch Press. In 1923 Francis and Vera Meynell and David Garnett started the N. P., and the ed. of the *Lore Poems* of John Donne proved the herald of far-reaching changes both in publishing technique and typographic style. The objects of the new press were defined in its first prospectus as follows: 'To choose and make books according to a triple ideal; significance of subject, beauty of format, and moderation of price.' The N. P. by 1949 has produced some eighty limited eds. and thirty-seven unlimited. Perhaps the most outstanding limited eds. are the seven-vol. ed. of Shakespeare and the twenty-three-vol. ed. of Dickens, for in these great works especially Sir Francis Meynell displays his skill both as a typographer and designer. Of the unlimited eds. the Nonesuch Library (also known as the Compendious series) is particularly important. These books are uniform in size, though not in detail, and have had much influence upon publishing methods.

Non-Intervention Committee, committee of various European states set up at the beginning of 1937 to supervise measures agreed on between them to stop the flow of volunteers to both sides in the Sp. civil war, 1936-39. It formulated a plan for watching the Sp. coasts and frontiers which by the autumn had proved unworkable, gaps and loopholes in it having permitted enormous quantities of war material and even whole armies to come to Spain, while Germany sent bombers to attack the tns. of the republicans. Germany and Italy withdrew from the N.-I.C. in June 1937 after the bombing of the Ger. ship *Deutschland*, but later returned. In the last stage of the conflict the committee ceased its activities, the policy of non-intervention having in fact much favoured the insurgents, for the republicans had derived little effective countervailing help even from the Soviet Union. See further under SPAIN. *History*.

Nonius, FERNAN, see NUNEZ.

Nonius Marcellus, Lat. grammarian, probably of the third and fourth centuries A.D. He is noted as the author of *De compendiosa doctrina* valuable

for the fragments preserved from old dramatists, satirists, and annalists such as Ennius, Cato, and Varro. Priscian and Fulgentius borrowed from this work. See eds. of Junius (1565); Gothofredus (1586); Mercier (1583, 1614, 1826); Gerlach and Roth (1842); Müller (1888); Onions, I.-III. (1895); and W. M. Lindsay (1930). See also L'enuf and Schwabe, *History of Roman Literature*, II., and Nettleship, *Essays in Latin Literature*, 1883.

Non-Jurors, those clergy of the Church of England who after the revolution of 1688 refused to take the oath of allegiance to William and Mary. They were headed by Wm. Sancroft, archbishop of Canterbury, and included seven other bishops, Ken of Bath and Wells, White of Peterborough, Lake of Chichester, Turner of Ely, Frampton of Gloucester, Thomas of Worcester, and Lloyd of Norwich. About 400 of the lower clergy refused to take the oath, among them being many distinguished ecclesiastics. Some soon returned to the Estab. Church, but the body continued to exist with gradually diminishing numbers well on into the nineteenth century. See T. Lathbury, *History of the Non-Jurors*, 1845, and J. H. Overton, *The Non-Jurors*, 1902.

Non-Metals, one of the two classes into which chemical elements are divided. Their characteristic physical properties are as follows: they may be gases, liquids, or solids at ordinary temps., and most of the liquid and solid N.-M. are easily converted into the gaseous state at comparatively low temps. They are brittle, if solid, generally have a low sp. gr., and are bad conductors of heat and electricity. The chemical properties give a more definite test. The N.-M. form acidic oxides, they are not acted upon by dilute mineral acids, and generally form stable compounds with hydrogen. The distinction between N.-M. and metals is, however, by no means always well defined, and sev. elements, such as arsenic and antimony, possess characteristics of both classes. Examples of N.-M.: hydrogen, oxygen, nitrogen, chlorine, helium, carbon, sulphur, boron, phosphorus, silicon.

Non Nobis Domine, canon by Wm. Byrd (q.v.), which is often sung in place of grace after dinners.

Nonnus, Gk. epic poet of the fifth century A.D. (fl. c. 410), a native of Panopolis, Egypt. His most noted work is the *Dionysawa* (History of Bacchus). A *Paraphrase of St. John* is also extant (written in Gk. hexameters). N. was probably a Christian. His *Dionysiaca* was ed. by Köchly (1658); by Grifte (1819-26), by Marcellus (1856); and by A. Ludwich, 1909-11. See J. Welcher, *Dissertatio de Nonno*, 1810; S. S. Uvarov, *Nonnos*, 1817; Naeka, *De Nonno Imitatore Homeri*, 1835; Janssen on his works, 1903; and trans. (Ger.) by T. von Schaffner, 1929-33.

Nonnus (Nonus), Theophanes, Gk. physician of the tenth century (d. A.D. 959). He dedicated his work *Compendium totius Artis Medicinae* to the Emperor Constantine Porphyrogenitus (911-59). It was pub. by Jerimias Martinus (1568), and an improved form (1794-97) ed. by J. S.

Bernard. See J. Freind, *The History of Physick*, 1725-26; C. P. J. Sprengel, *Histoire de la Médecine* (trans.), 1815-32.

Nonpareil, printing type (6 point), in which the text of this encyclopaedia is set. The Fr. name signifying 'none similar' refers to the exceptional skill displayed in the final cutting of so small a character. See TYPE AND TYPESETTING.

Non-Possimus (Lat., 'we cannot'), papal formula used to express refusal, final and absolute, taken from the words of St. Peter and St. John (Acts iv. 19-20). It is said to have been used by Clement VII. in reply to Henry VIII.'s demand for a divorce from Catherine of Aragon.

Non-Suit. Technically a N.-S. no longer exists. Under the former practice N.-S. meant the voluntary abandonment by the plaintiff of his action, either because the judge or jury appeared to be against him or because in argument it appeared that in law he had no case. It differed from an adverse judgment in that it did not bar him from commencing the action again. In the days when forms of action, e.g. *detrinue* (q.v.) *trespass* (q.v.), were so highly technical that the slightest verbal slip in the pleadings endangered the whole action, N.-S. were frequent, but since the legal reforms of the last century such un-substantial formalities, and together with them N.-S., have been abolished. Popularly the expression N.-S. is used to denote the fact of the judge having withdrawn a case from the jury either of his own motion or because counsel for the defendant has satisfied him that in law there is no case to answer or no evidence against his client (see also *NOLLE PROSEQUITI*). There is no formality to be observed, and the submission that there is no case can be argued at any stage of the proceedings.

Noon, Malik Sir Fiaz Khan (b. 1893), Indian statesman and lawyer, b. at Lahore, son of Nawab Sir Malik Mohammed Hayat Khan N., educated at Chiefs' College, Lahore, and Wadham College, Oxford. He was successively advocate at Lahore high court, 1917-26; member of the Punjab legislative council, 1920-36; minister for local self-government, Punjab Gov., 1927-30; minister for education in the Punjab, 1931-36; commissioner for India in the United Kingdom, 1936-41; member of the viceroy's executive council, 1941-45; Labour member of the governor-general's executive council, India, 1941-1942; and defence member of the governor-general's executive council, 1942-45. Knighted in 1933, N. was a delegate from India to the San Francisco Conference, 1945. In 1946 he renounced his title, in common with the other leading figures in the Moslem League. Later he became a member of the legislative assembly of the W. Punjab, but took no office (1949) in the Pakistani Gov.

Noordoostelijke Polder, see NORTH-EAST POLDER.

Noort, Adam van, see OORT.

Nootka Language, see under NORTH AMERICAN NATIVE LANGUAGES, Pacific Areas.

Nootka, or Moatsaht (Mowachaht), tribe of the Aht, a div. of the Wakashan

('good') stock of N. Amer. Indians. They dwell on the W. coast of Vancouver Is., near Nootka Sound, and in the S. part of Brit. Columbia. They number about 2000 and many are professedly Christians. The Makaw or Kwakiutl, who settled in Washington, are a branch of the same linguistic stock (Haeitzuk div.).

Nootka Affair (1788-90). An incident of the days of Anglo-Sp. colonial rivalry. In 1788 Capt. John Mearns, an aggressive Eng. maritimo trader, erected a store building on Nootka Is. and built a 30-ton schooner, the *North-west America*, the first ship launched on the Brit. Columbia coast. His evident intention to trade there permanently moved the Spaniards to interference and, in the spring of 1789, a 20-gun Sp. warship appeared off the is. Its commander, Don Joseph Martinez, seized the *North-west America* and other Eng. vessels there and constructed fortifications. Mearns was then in Macao, but, on learning what had happened, hastened

new order quickly spread over W. Europe. N. himself, compelled to accept the see of Magdeburg, began the reformation of his clergy, by force when necessary. He upheld the doctrine of the Real Presence and fostered the cult of the Blessed Sacrament. N. was canonised in 1582.

Nord, most northerly dept. of France, adjoining Belgium, and washed by the North Sea, formerly a prov. of Fr. Flanders. It is divided into six arronds., Lille, Avesnes, Cambrai, Douai, Dunkirk, and Valenciennes. The greater part of the surface is flat, fertile, and well cultivated, watered by the Scheldt and the Sambre. The inhab. are half Flemish and half Fr.-speaking Walloons. The chief agric. products are wheat, oats, potatoes, sugar-beets, flax, chicory, and some tobacco. Stock-raising and fishing are important industries. The tn. of Valenciennes lies in the centre of the richest coal-field in France. N. is one of the leading manufacturing depts., making iron and steel



Norddeutscher Lloyd

THE 'EUROPA' (NOW 'LIBERTE'), SISTER SHIP TO THE 'BREMEN'

to appeal to the Brit. Gov., which at once decided to force Spain to a settlement. Spain was in no position to resist, especially as her potential ally, France, was involved in the opening stages of the revolution. The Spaniards accordingly restored Mearns's property and, furthermore, agreed that Brit. subjects should have trading and colonising rights N. of the 38th parallel of lat. It was in this way, in 1790, that Spain modified her age-long exclusive claims to the Amer. Pacific coast.

Nootka Sound, harbour of the Pacific coast of Canada, lying behind Nootka Is. on the W. coast of Vancouver Is. N. S., Barclay Sound on the S.W. coast of Vancouver, and Quatsenough Sound on the N.W. coast, all send branches into the heart of Vancouver Is.

Norbert, Saint (c. 1080-1134), was b. of a princely family at Xanten. He led a worldly life at the Ger. court and received holy orders for the sake of material advancement. In 1115, however, a narrow escape from death brought about his conversion. After trying to reform the chapter of canons at Xanten he became an itinerant preacher. Given the ter. of Prémontre near Lao in 1120, he estab. a community of canons regular under the Augustinian rule, since known as Premonstratensians or Norbertines. His

goods, beet sugar, glass, chemicals machinery, textiles, and porcelain. Cap. Lille. Other tns.: Dunkirk, Cambrai, and Douai. Area 2228 sq. m. Pop. 1,917,500.

Nordau, Max Simon (1849-1923), Ger.-Hungarian physician and author, b. at Budapest, of Jewish descent. Studied medicine and travelled widely. He practised medicine in Budapest and, later, settled in Paris as a physician. Turning to literature, he wrote novels and plays in a satirical vein to illustrate his social theories, but he is more widely remembered for his analytical studies of contemporary society, notably *The Conventional Lies of Civilisation* (1883; Eng. trans. 1884); *Paradoxes* (1885; Eng. trans. 1890); *The Matador of the Century* (1887); *Degeneration* (an attempt to relate genius to degeneracy) (1892-95; Eng. trans. 1895). In these and other critical studies of modern society N. applies the theories of Lombroso (q.v. and also CRIMINOLOGY) to which he was strongly attracted. His other works include *A Comedy of Sentiment* (1891); *The Drones must Die* (1898); *Morganatic* (1904); *The Interpretation of History* (1909); *Zionistische Schriften* (1909, 1923); *Biologie der Ethik* (1921); and essays, fairy tales, and travel books.

Norddeutscher Lloyd (North Ger. Lloyd), Ger. steamship line, was inaugurated by

H. H. Meier, a citizen of Bremen, who in 1857 induced the various shipping industries of the tn. to amalgamate under the name of the N. L. In 1881 the first of the company's Atlantic service boats was built, and from that time until the First World War its prosperity increased. From the headquarters at Bremen many lines of steamers ran to New York, Baltimore, Brazil, Galveston, the R. Plate, etc. Mail steamers ran between Bremen and America, Asia, Australia, etc. There was also a Chinese coasting trade of considerable magnitude. In 1914 the company had 135 sea steamers and hundreds of auxiliary craft totalling nearly 1,000,000 tons gross. As a result of the peace treaty all that remained of the great mercantile fleet was their seaside steamers, lighters, and tugs; but surprising activity produced great recovery, and such large ships as the *Bremen*, the *Europa*, and the *Columbus* (among the biggest merchant ships afloat) were typical of the company's energy. Before the Second World War the total tonnage was nearly 1,000,000. The *Bremen* was burnt at Bremerhaven in 1941, the *Europa* is now the *Fr. Liberté*, and the *Columbus* was sunk in 1939.

Norden, John (1546-1625), Eng. topographer and surveyor. According to Anthony Wood, N. was b. of a genteel family, but there is not sufficient evidence to confirm that he belonged to Wiltshire, and more probably his father was a native of Middlesex. A privy council order of Jan. 1593, addressed to lieutenants and other co. officers, declared that 'John Norden, gent., was authorised and appointed by the Queen to travel through England and Wales and make descriptions, charts and maps.' and the outcome of this order was his first work *Speculum Britanniae, first part: Middlesex* (1593). N. was the first to project a complete series of co. histo., but he was prevented by monetary difficulties from completing this design. He pub. *Hertfordshire* in 1598, and completed in MS. *Essex, Northampton, Cornwall, Surrey, and Kent*. He was surveyor of crown woods, 1600; surveyor to the duchy of Cornwall, 1605; and, in 1607, surveyed Windsor and its neighbourhood. He pub. *Observations concerning Crown Lands and Woods* in 1618. He engraved a number of maps, in which roads were indicated for the first time. His maps of London and Westminster were dated 1593 but are somewhat later than those of Aggas and van den Wyngaerde. By the aid of these maps we can obtain a very fair notion of the extent and major features of Tudor London. His *Surveyor's Dialogue* (printed 1607 and reprinted 1618) is among the more meritorious of the earlier works on agriculture. The first three books deal with the now more or less obsolete rights of the lord of the manor and the various old forms of land tenure, together with the obligations they involved. The later vols. are characterised by shrewd observations on the 'different natures of grounds, how they may be bettered, employed and amended.' In this work N. mentions the famous meadow lands near Salisbury.

Nordenfelt-Palmorantz Gun, see MA-CHINE GUNS.

Nordenståhl, Nils Adolf Erik, Baron (1832-1901), Swedish geographer and explorer, b. at Helsingfors, Finland. After sev. successive voyages and explorations with Tonelli in the Arctic Sea, with frequent visits to Spitsbergen, where he measured an arc of the meridian, in 1878-1879 he discovered the N.E. Passage by traversing, along the N. shores of Europe and Asia, the whole Arctic from the Atlantic to the Pacific. He contributed to the science of geographical research, particularly in his work *Perillus* (1897). His publs. in Eng. include *The Voyage of the 'Vega' around Asia* (1881) and *The Second Swedish Expedition to Greenland* (1885). See life by S. Hedlin, 1928.

His nephew, Nils Otto Gustaf N. (1869-1928), explored the Magellan Straits and Patagonia in 1895-97, and Alaska in 1898; he also led the Swedish expedition which discovered Oscar II. Land, 1901-4. See life by G. Bodman, 1928.

Norderney, most important of the E. Frisian Is., in the North Sea, belongs to Lower Saxony, Germany. It is 8 m. long, 1 1/2 m. broad, with an area of 8 sq. m. It is the most popular of Ger. seaside resorts. Pop. 5200.

Nord Fjord, inlet on the W. coast of Norway, extending for about 30 m. inland; the sea enters by two mouths, the Faa Fjord and the Froi Fjord. The scenery is beautiful.

Nordhausen, tn. of Thuringia, Germany. 60 m. from Halle, with distilleries and numerous manuf., including textiles, chemicals, tobacco, and engineering. Pop. 30,000.

Nordic, Nordism, denote the tall, blond, dolicocephalic race found mainly in Scandinavia, and, to much less extent, in Germany, Denmark, and other countries. The theory that the Ns. are a superior race from which all European culture has sprung seems to have originated with Joseph de Gobineau (q.v.), author of *The Inequality of Human Races*, whose pseudo-scientific doctrine found a temporary popularity in the early twentieth century in the U.S.A. and, subsequently, had its effect on the immigration quotas at the expense of people of Jewish or S. European extraction. This theory also finds an echo in Carlyle's works, in Madison Grant's *The Passing of the Great Race*, and in Nietzsche's cult of the 'superman.' It was carried further by the renegade Englishman, Houston Stewart Chamberlain, from whose time it had a great vogue in Germany. Nordism then developed as a political weapon of Ger. imperialism, the Germ. being proclaimed by their propagandists as Ns. (though only some 20 per cent of Germ. can be described as N.), whose mission was to rule all other peoples as being of lower racial value. The extremist advocates of Nordism contended that all great men in hist. science, and art have been Ns., while some even assert that antcl. Gk. culture was the work of blond Ns. who conquered Greece 4000 years ago. One school of N. theorists

holds that the Ns. are the best of the 'Aryan' races, while others go much further, claiming that Aryan and N. are synonymous (*see* on this ARYAN OR ARIAN). In fact, the N. race, as distinct from the N. type in Scandinavia and other countries, is mythical. The existence of a common N. primitive people has never been estab., and long centuries of interbreeding has produced innumerable blends of N. with other types. The contention that to Ns. alone are due the achievements of the European peoples is manifestly fantastic. The Nazis, for their own ends, erected Nordism into a veritable state creed. Slavs were contemptuously regarded as 'sub-human,' while the Jews became the special objects of Ger. animadversion and persecution (*see also* 'MEIN KAMPF').

Nordic Runes, *see under RUNES.*

Nordland, co. of Norway, having a length of 300 m., lies along the coast. The Vikten Is. and others fringe the coast-line, and the co. includes the Lofoten Is. Bodø, on Salt Fjord, is the chief tn. Area 14,727 sq. m. Pop. 214,700.

Nordlingen, tn. in Bavaria, Germany, situated on the Eger, and 40 m. distant from Augsburg by rail. It was at one time a free city, and still shut in by walls and towers. Among the various objects of interest are some paintings by Hans Schaufelein, a tower 290 ft. high, St. Saviour's Church of 1422, and a tn. hall in late Gothic style. Pop. 8400.

Nordrhein-Westfalen, *see NORTH-RHINE WESTPHALIA.*

Nord-Trøndelag, co. of Norway, with a short Atlantic coast-line near the Vikten Is. Long fjords include Folden, Nansen, and Trondhjem, the latter traversing almost half the co. Levanger is the chief tn. Area 8659 sq. m. Pop. 104,600.

Nore, The sandbank at the mouth of the R. Thames, marked by sev. buoys and at one time by lightships with revolving lights. The N. lightship at the E. end of the sandbank 4 m. N.E. of Sheerness, was removed early in the Second World War, and replaced by the Great Nore Tower which formed part of the Thames defences. Hamblin placed the first light here in 1731. The celebrated N. mutiny occurred in the vicinity in 1797.

Norfolk, Dukes of, *see HOWARD.*

Norfolk, Henry Fitz-Alan Howard, fifteenth Duke of, *see HOWARD.*

Norfolk, Hugh Bigod, first Earl of (d. 1176 or 1177), received his earldom as a reward for his assistance to Stephen in obtaining the Eng. crown. He was noted for his treachery and double dealing, even in the faithless age in which he lived. In 1169 he was one of the nobles excommunicated by Becket, and in 1175 was obliged to forfeit his charties. He is supposed to have d. in Palestine.

Norfolk, Roger Bigod, second Earl of (d. 1221), was the son of the first earl of N. During the reign of Henry II. he had little power, but he was in favour during all Richard's reign, being ambas. to France on one occasion. He retained his power during John's reign, save for a

short interval in 1213, but was excommunicated by Innocent II. as one of the twenty-five executors of Magna Carta. On the accession of Henry III. he regained his honours, and his hereditary right to the stewardship of the royal household was recognised.

Norfolk, Roger Bigod, fourth Earl of (d. 1270), marshal of England, was one of the members of the party of reform in opposition to Henry III. He was prominent in the promulgation of the Provisions of Oxford, but later the dissensions of the barons caused him to transfer his allegiance to the side of the king. After supporting Henry III. in 1259, N. joined de Montfort. In 1265 he was one of the five earls summoned to the Parliament.

Norfolk, Roger Bigod, fifth Earl of (1245-1306), marshal of England, was one of the leaders of the nobles in their struggle against Edward I. He and Bohun, earl of Hereford, were foremost in refusing to go on foreign service unaccompanied by their sovereign. In 1297 they secured the confirmation of the charter, which was ratified by Edward at Ghent, and in 1301 signed by him in person.

Norfolk: 1. Maritime co. of E. England, on the North Sea. The coast-line is mainly flat and low, though in places the cliffs reach the height of 200 ft. In parts the sea has much encroached, though near Lynn thousands of ac. of land have in the past been reclaimed from the Wash. The first new enclosure for fifty years was completed at Holbeach in 1948. There are few inlets, and owing to the numerous sandbanks the coast is dangerous. Yarmouth and Lynn are the prin. ports. The fine climate and long stretches of sand have made Yarmouth, Cromer, Hunstanton, etc., favourite watering places. The surface is for the most part level, and includes, in the W., part of the Fen country (*q.v.*) known as the Bedford Level. The prin. rvs. are the Yare and the Great Ouse, with their trib. One of the chief features of the co. is the broads (*q.v.*), a series of beautiful lakes famous for their fishing and water fowl, and also for the boating, ann. regattas being held. Windmills are a feature of the broadland, their purpose being to keep the marshes drained by pumping water from the dykes into the rvs.; but to-day the greater number of them are derelict and have been replaced by power-driven plant. Building stone, locally known as 'gingerbread stone,' is quarried at Snettisham and the neighbourhood, clay is dug for bricks and tiles at Hunstanton, Snettisham, etc.; limestone is quarried at Marham, and flints are worked for facing walls, etc. The soil is extremely varied; chalk, sand, and loam being prevalent in different dists. Agriculture flourishes, oats, wheat, and barley being grown in great quantities. Cattle are extensively reared, and the green crops consequently include turnips and swedes; beans are also grown, and some fruit. The prin. manufs. are cloth (worsted having taken its name from the long decayed tn. of Worsted), silk and wool weaving, and boots and shoes. There are a number of flour-mills and mustard

factories. 2. The county of Norfolk, bounded on the N. by the North Sea, on the E. by the Wash, on the S. by Suffolk, and on the W. by Cambridgeshire. It is roughly triangular in shape, and is the largest co. in England. The area is 2,370 sq. m. The pop. in 1931 was 1,000,000. The county town is Norwich, which is the largest town in the co. Other towns of importance are King's Lynn, Cromer, Great Yarmouth, Lowestoft, Dereham, Thetford, Fakenham, Holt, Wisbech, Wisbech St. Mary, and Bury St. Edmunds. The co. is divided into six districts: Broadland, Breckland, North Norfolk, South Norfolk, North Suffolk, and South Suffolk. The co. is well provided with canals, and the rivers Yare, Bure, Waveney, Ant, Little Ouse, and Great Ouse are navigable. The co. is well provided with canals, and the rivers Yare, Bure, Waveney, Ant, Little Ouse, and Great Ouse are navigable.

works; agric. implements are made; tanning, malting, and brewing are also carried on; and there are fisheries at Yarmouth. Large numbers of geese and turkeys are reared.

Sandringham is a royal country seat; and there are many fine churches, especially the beautiful Norman cathedral at Norwich (q.v.), originally part of a Benedictine monastery. The vil. churches of the N. marshland are notable for their length and beauty. Among them may be mentioned Walsoken, Emmeth, and West Walton, all near Wisbech; Terrington St. Clement and Tilney All Saints nearer King's Lynn; and Walpole St. Peter,

field and Walter Rye (see under BLOMEFIELD, FRANCIS and RYE, WALTER). See F. Blomefield, *Norfolk Genealogy and Heraldry*, 1885-87; W. Rye, *History of Norfolk*, 1885; *Norfolk Records* in the Public Record Office, 1886-92; W. A. Dutt, *Norfolk*, 1900; *Victoria County Histories: Norfolk*, 1901-6; W. G. Clarke, *Norfolk and Suffolk*, 1921; D. Maxwell, *Unknown Norfolk*, 1925; A. H. Patterson, *Through Broadland by Sail and Motor*, 1930; E. W. Priest, *Vanishing Local Traditions of Norfolk*, 1930; A. Mee, *Norfolk*, 1942; R. H. Mottram, *Norfolk*, 1946; and E. T. Long, *Norfolk* (Batsford-Methuen Little Guides, revised ed., 1949).



John H. Stone

THE NORFOLK COAST: CROMER FROM THE EAST

which is especially notable for its embattled parapets and its gargoyle. At Castle Rising there is a fine Norman church and also the ruin of a Norman castle, while Norwich Castle is still in good preservation. Other interesting feudal and monastic ruins are Castle Acre, Bayham's Abbey, Bacton Abbey, etc. A mile N.W. of Aylsham and 9 m. S. of Cromer is Blickling Hall, a famous Jacobean house built 1619-24 (see under ARCHITECTURE, *The Renaissance*; BLICKLING). The co. originally formed part of E. Anglia, and suffered many incursions from the Danes. Very many discoveries of relics of prehistoric man have been recorded. With the exception of Wiltshire, N. has more scheduled ant. monuments than any other co.

N. is divided into thirty-three hundreds; there are six co. parl. constituencies and two bor. constituencies. The area is 2018 sq. m. Pop. 504,900.

The leading authorities on the antiquities and hist. of N. are Francis Blome-

field and Walter Rye (see under BLOMEFIELD, FRANCIS and RYE, WALTER). See F. Blomefield, *Norfolk Genealogy and Heraldry*, 1885-87; W. Rye, *History of Norfolk*, 1885; *Norfolk Records* in the Public Record Office, 1886-92; W. A. Dutt, *Norfolk*, 1900; *Victoria County Histories: Norfolk*, 1901-6; W. G. Clarke, *Norfolk and Suffolk*, 1921; D. Maxwell, *Unknown Norfolk*, 1925; A. H. Patterson, *Through Broadland by Sail and Motor*, 1930; E. W. Priest, *Vanishing Local Traditions of Norfolk*, 1930; A. Mee, *Norfolk*, 1942; R. H. Mottram, *Norfolk*, 1946; and E. T. Long, *Norfolk* (Batsford-Methuen Little Guides, revised ed., 1949).

2. City and port of N. co., Virginia, U.S.A., on Chesapeake Bay. It exports coal, cotton, lumber, and tobacco, and manufactures, hosiery, cotton, silk, machinery, fertilisers, chemicals, cement, lard, tobacco and cigars, and automobiles. It also has a large trade in peanuts. N. builds ships and is important both for its fisheries and its naval base. Pop. 144,300.

3. Tn. of Madison co., Nebraska, U.S.A., 96 m. N.N.W. of Omaha. Pop. 16,100.

Norfolk Island, in the Pacific, about 400 m. N.N.W. of New Zealand, is under Australian Commonwealth Gov. administration. It was first discovered by Capt. Cook in 1770, and was shortly afterwards made a penal settlement. Then it was occupied by the Pitcairn Islanders, who, however, soon deteriorated, owing to intermarriage. Some Pitcairn Islanders still live in N. I. It is the headquarters of the Melanesian Mission, which was

inaugurated in 1867. The is. is 5 m. long and $2\frac{1}{2}$ m. broad, and comprises an area of nearly $13\frac{1}{2}$ sq. m. The soil is fertile, yielding fruits of all kinds, such as oranges, lemons, figs, grapes, bananas, pineapples, etc. Coffee is also grown. The Norfolk pine (*Araucaria excelsa*) (q.v.) is a splendid tree of giant size. The coast of the is. is steep and rugged, and the highest peak is Mt. Pitt (1050 ft.). N. I. is a cable station and has a pop. of 938.

Norfolk Regiment, old 9th Foot regiment, raised in 1685 in the W. of England, but, soon afterwards, designated the 9th (E. Norfolk) Regiment. Of its earlier battles, that of Almanza, though not among its battle honours, is remembered in its annals for the part played in covering the retreat of the Brit. Army under Gen. Ptanhapo. This exploit is commemorated by the figure of Britannia in its badge. The regiment fought in most of the great Peninsular battles, and thereafter had a distinguished record in India, Cabool, Moodkee, Ferozeshah, and Sobraon, all being among its honours. In the First World War the first battalion fought in all the prin. battles of the opening months; the second battalion joined the Gallipoli expedition, one of its companies marching across country and losing practically every man. This battalion then joined Townshend's ill-starred force in Mesopotamia and, after strenuous exertions, surrendered in 1916 with the rest of the Brit. force besieged in Kut. Other battles in which one or other of the battalions, regular or territorial, fought were the Somme (Delville Wood), Ypres (Poelcapelle), and Bapaume. In the Second World War one battalion was in Singapore when the is. was taken by the Jap. Other units participated in the Burma campaign, being conspicuous at Kohima, 1944. See F. L. Petre, *History of the Norfolk Regiment, 1685-1913, 1925*.

Norfolk Spaniel, see under SPANIEL.

Norge, see NORWAY.

Norie Alps are named after Noricum (q.v.). Rising between the Drave and Mur valleys, they are a part of the E. Alps, extending N.E. from the Rhaetian Alps. Elsenhut (8000 ft.) is the highest peak.

Noricum, in ant. geography, was a ter. which became converted by Cesar into a prov. towards the end of the first century. It corresponds to the present provs. of Salzburg, Carinthia, and Styria.

Norma (the 'Rule' or 'Square'), small and unimportant S. constellation, catalogued by La Caille, 1732; the brightest star, 4·6; seven other stars between 4·6 and 5·5.

Normal, in geometry, is a straight line drawn from any point on a curve, in its plane, at right angles to the tangent at that point, or a line drawn from any point on a curved surface at right angles to the tangent plane at that point.

Normal Schools, see TRAINING COLLEGES.

Normal Solution, in chem., a solution one litre of which contains the equivalent in grammes of the dissolved substance. Thus the equivalent of sulphuric acid

is 49, so that one litre of N. sulphuric acid solution contains 49 grammes of sulphuric acid. Deci-, semi-, etc., N. Ss. contain one-tenth, one-half, etc., of the equivalent weight of the dissolved substance per litre of solution. N. Ss. are much used in chemical analysis.

Normal Temperature and Pressure. For convenience the properties of gases are always given on a standard basis of temp. and pressure which is known as *normal temperature and pressure* (N.T.P.). The temp. is taken as 0° Centigrade and the pressure as 14·7 lb. per sq. in., which is the average atmospheric pressure. This may be illustrated by examples: At N.T.P. 1 lb. of air occupies a volume of 12·39 cub. ft. Give the value of C (=constant for any given gas, each type of gas having its own value for C) for air in (a) Centigrade units and (b) Fahrenheit units. Let T = absolute temp. of gas, w = weight of gas under consideration in lb., p = the pressure in lb. per sq. ft., and that for atmospheric air $C=96$ ft.-lb. Centigrade units or 33·3 ft.-lb. Fahrenheit units:

Centigrade units:

Using the equation $pv = CwT$:

$$\text{At N.T.P.} \quad p = 14\cdot7 \times 144 \text{ lb. per} \\ T = 273^{\circ} \text{ abs. sq. ft.}$$

hence

$$C = \frac{144pv}{T} \text{ for 1 lb.} \\ = \frac{144 \times 14\cdot7 \times 12\cdot39}{273} \\ = 96 \text{ ft.-lb. Centi-} \\ \text{grade units.}$$

Fahrenheit units:

$$T = 32 + 460 = 492^{\circ} \text{ abs.}$$

$$C = \frac{144 \times 14\cdot7 \times 12\cdot39}{492}$$

$$= 53\cdot2 \text{ ft.-lb.} \\ \text{Fahrenheit units.}$$

Again to find the weight of 100 cub. ft. of air at a pressure of 15 lb. per sq. in. and a temp. of 60° Fahrenheit. C for air is 53·2 in Fahrenheit units.

Using the equation $pv = CwT$,

$$\text{then} \quad p = 144 \times 15 \text{ lb. per} \\ \text{sq. ft.} \\ T = 460 + 60 = 520^{\circ} \\ \text{Fahrenheit abs.} \\ w = \frac{144 \times 15 \times 100}{53\cdot2 \times 15 \times 520} \\ = 7\cdot85 \text{ lb.}$$

*The best and most convenient form of the characteristic equation of a gas. A perfect gas is one which obeys this characteristic equation; no known gases are perfect. See further on this GAS AND GASES, Van der Waal's Equation. See also E. H. Lewitt, *Thermodynamics applied to Heat Engines*, 1937.

Norman, Sir Henry Wyllie (1826-1904), Eng. field marstl. He took an active part in the Indian mutiny, being present at Delhi and at the relief of Lucknow. He was made governor of Jamaica in

1883, governor of Queensland in 1888, and governor of the Royal Hospital, Chelsea, in 1901. He was made a field marshal in 1902.

Norman, Montagu Collet, first Baron (b. 1871), Brit. financier and banker, son of F. H. N., banker. Educated at Eton and King's College, Cambridge, he served in the S. African war, and afterwards became a partner in the family banking business and, in 1907, a director of the Bank of England. In 1920 he was made governor of the Bank of England, a post from which he retired in 1944, and a privy councillor in 1923. It was during his governorship that Britain, in common with other countries, after the First World War went off the gold standard, but in 1925 returned to the gold standard so far as foreign payments were concerned, despite the strong condemnation of the policy by Lord Keynes (*q.v.*). In 1931, however, when the financial and economic position had further deteriorated, gold payments were once more suspended and the gold standard has never since been restored (*see further under ECONOMICS*). During the period of his governorship N. was responsible for several important financial negotiations, notably those with the U.S.A. in 1923 which resulted in the agreement for the funding of the debt of £978,000,000 to the U.S.A. *See further under BALDWIN OF BEWDLEY, STANLEY, first EARL; BANK OF ENGLAND.*



NORMAN ARCHITECTURE
Eskdene Chapel, Rutland.

Norman, name given to the people of Normandy and their descendants in the European countries conquered by them. The word is identical with Northman or Norseman, but is mostly restricted to the mixed race which came into existence after the conversion of the heathen Norse settlers and their adoption of Fr. culture. Besides invading and conquering England in the eleventh century, the Ns. conquered and settled in S. Italy and Sicily, where they developed a notable civilisation. *See also under NORSEMAN.*

The term N. architecture denotes the style prevalent in England and Normandy during the eleventh and twelfth centuries, preceding the Gothic. A variety of Romanesque, it is distinguished by the rounded arch and the rectangular or plain round column. Some of the oldest buildings in England are in this style, e.g. the few extant fragments of Edward the Confessor's abbey of Westminster, notably the chapel of the Pyx and the Undercroft beneath the Islip Chapel. The massive N. pillars were sometimes scored with zigzag indentations. Good examples in England are Durham Cathedral and the Abbey Church of Waltham, Essex. *See further under ARCHITECTURE, Romanesque.*

Normanby, Marquesses of, *see SHEFFIELD, JOHN; PHIPPS, CONSTANTINE HENRY; PHIPPS, GEORGE AUGUSTUS.*

Normanby, tn. of the Eston U.D.C. in the N. Riding of Yorkshire, 3 m. S.E. of Middlesbrough. It has ironworks, and manufs. bricks. The marquesses of N. take their title from another vil. 5 m. S.W. of Pickering. Pop. 12,000.

Norman Conquest (1066-69). This movement originated in the accession of Edward the Confessor to the throne of England. This prince had spent the greater part of his life in Normandy before his accession to the throne of England. On the extinction of the Dan. dynasty he had been recalled to the throne of England as the nearest representative of the Saxon line. His early education made him particularly susceptible to Norman influence, and during the greater part of his reign a constant intrigue went on between Norman and Saxon court parties for the succession to the throne. Towards the end of his life he came under the influence of the Saxon party, and finally nominated Harold Godwinson as the heir to the Crown. During the temporary exile of the Godwins, however, William the Bastard had visited Edward and alleged that he held from him a promise that on his (Edward's) demise he should come to the throne of England. He had also held Harold a prisoner and had refused him release until he had sworn an oath that he would endeavour to obtain for William the throne of England. On the death of Edward the throne passed by election to Harold, and William, on the receipt of the news, began to prepare for an invasion. He landed at Povsky Bay in Oct. 1066, and was met at Hastings by Harold's army, which had already practically worn itself out at the battle of Stamford Bridge and by the hurried march S. The Normans were victorious and Harold was slain. It is impossible to enter into the details of the actual conquest here, but we can safely say that by 1072 England lay conquered at the feet of William. The Normans became the owners of the land, and the Saxons were treated, at first at any rate, as a conquered race. But the continental wars in which the Normans were constantly engaged rendered them increasingly dependent on Eng. co-operation, and estranged them in an equal degree from

their former compatriots in France; so that within two centuries the distinction between Norman and Eng. was obsolete in England. At the same time both Eng. blood and Eng. manners were improved by mixture with a higher civilisation; while the perfection to which the ruling race had brought their feudal system helped to strengthen the central power and to unify the nation. Nevertheless there was no clean break with the past, and William made a conscious effort to continue the institutions of the Confessor, for the greater stability of his own system. The basic difference was the introduction of feudal and tenure, for, in spite of surface similarities, the Saxon system was not built upon the feudal essential, namely, the granting of a definite piece of land in return for defined services, chiefly military. *See also WILLIAM THE CONQUEROR.* *See E. A. Freeman, The Norman Conquest, 1867-79, and F. M. Stenton, Anglo-Saxon England, 1943.*

Normand, Henri René Le, see LE NORMAND.

'Normandie,' until 1943, largest Fr. merchant steamship (less in tonnage than the *Queen Mary* and *Queen Elizabeth*, but longer than both), belonging, until the Second World War, to the Compagnie Générale Transatlantique, was completed in 1933 at a cost of £10,006,000. She had a tonnage (gross) of 79,280, with a displacement of 53,000 tons; quadruple screw; length, 1029 ft.; beam, 119 ft.; depth, 91·8 ft.; speed, 28½ knots. The N. crossed the Atlantic (Bishop Rock to Ambrose Light) in 1935 in 4 days 3 hrs. 2 min. and in 1937 in 3 days 23 hrs. 2 min. (which time, however, was beaten by the *Queen Mary* in 1938 (3 days 21 hrs. 45 min. and 3 days 20 hrs. 42 min.) She was taken over during the Second World War by the Amer. Gov. for conversion into a troopship and renamed *Lafayette*. But, while lying at her Hudson R. pier, she caught fire on Feb. 9, 1942, through the carelessness of a workman with his torch, and capsized from the hundreds of tons of water that had been poured into her to put out the flames. The charred hull was not finally raised until Aug. 1943 and the estimated total cost of the complicated and protracted salvage operations, including the pumping out of the ship, was \$3,759,000.

Normandy (Fr. *Normandie*), formerly a prov. in the N. of France bordering on the Eng. Channel, now divided into the depts. of Seine-Inférieure, Eure, Orne, Calvados, and Manche. It is in general a very fertile, richly cultivated land, resembling a garden in many dists. Its chief agric. products are corn, flax, hemp, colza, and fruits (from which cider is largely made); its fisheries and manufs. are of great importance and its horses the best in the country; sheep and dairy-farming are important industries. There are iron mines near Caen. The prin. tns. are Rouen, Dieppe, Le Havre, Harfleur, Honfleur, Caen, Falaise, St. Lô, Bayeux, Coutances, Avranches, Alençon, Cherbourg, and Mont-St.-Michel.

In the time of the Romans the country

bore the name of Gallia Lugdunensis II. Under the Frankish monarchs it formed a part of Neustria, and was first called Normandy after Charles the Simple, in 912, had given it to Rolf or Rollo, the leader of a band of Norse rovers (*see Noisemem*), to be held by him and his posterity as a fief of the Fr. crown. His descendant, William II., son of Robert II., became duke of Normandy in 1036, and in 1066 estab. a Norman dynasty on the throne of England (*see NORMAN CONQUEST; WILLIAM THE CONQUEROR*). In 1077 his eldest son, Robert, wrested Normandy from him, but it was again united to England under Henry I. in 1105. Henry II., the son of Henry I.'s daughter, Matilda, after the death of Stephen of Blois, obtained in 1154 the government of England and Normandy; but in the reign of his son, John Lackland, it was conquered by Philippe Auguste (1203-4). It remained a portion of the Fr. monarchy for more than 200 years, but after the battle of Agincourt (1415) it was reconquered by the Eng., who held it till 1449, when it was finally wrested from them by Charles VII. In 1870 N. was partly occupied by the Germans, and in the First World War was the prin. base of the Brit.

Many famous tns., large and small, suffered grievous damage in the campaign of 1944. Le Havre, Caen, St. Lô, and Coutances were among those which sustained the greatest damage. Isigny-sur-Mer, Lisieux, Laigle, and Tilly-sur-Seulles, to mention but four among many whose names are evocative of old memories, can no longer delight either the eye or the spirit. Much, however, has survived. Bayeux is unharmed, the cathedral at Coutances stands up amidst ruins, Ourstreham's fine church, which the shells for two and a half months daily sought out for destruction, is intact, while many smaller treasures, such as Corneille's house at Canapville, came through safely. For a full account of the battle of Normandy, 1944, *see under WESTERN FRONT IN SECOND WORLD WAR.* Sec. P. de Felice, *La Basse-Normandie*, 1907; H. Prentout, *La Normandie*, 1910, and *Essai sur les origines et la formation du duché de Normandie*, 1911; P. Dearmer, *Highways and Byways in Normandy*, 1924; R. Elston, *Travels in Normandy*, 1930; C. L. Graves, *Deauville Taxi*, 1937; A. H. Brodrick (ed.), *Normandy*, 1947; R. Dutton and Lord Holden, *The Land of France* (2nd ed., revised), 1947; and the earl of Onslow, *The Dukes of Normandy*, 1948.

Norman-French, Fr. dialect which originated after the settlement of the Scandinavian invaders, under Rollo, in Normandy, about 911. N.-F. was prominent in the growth of O.F. literature, and can be read in the twelfth-century chronicles of Wace. It was introduced into England at the Conquest (but as later developed in England is also known as *Anglo-Fr.*, differing from N. F. as spoken in Normandy by the use of Saxon words for ideas for which there was no Fr. word). N.-F. was the language of the court for

sev. centuries, and was used for law reports until the middle of the sixteenth century. In 1362 a statute ordained that pleadings should be in Eng., but should be enrolled in Lat., but the language of the statute book was still Fr. in 1483. The earliest important law treatise in N.-F. is *Britton* (1291) and the latest *Littleton* (1481). A considerable amount of literature, poetry, and prose in N.-F. has been preserved. See W. W. Skeat, *Principles of English Etymology* (2nd series), 1891.

Norman-Neruda, Wilma Maria Francisca, see HALLE, LADY.

Normans. see NORMANDY; NORSEMEN.

Normanton, tn. in the W. Riding of Yorkshire, England, situated on the Calder, 24 m. from York. Besides an old Norman church there are traces of a Rom. encampment in the vicinity. There is a grammar school of the sixteenth century. N. is an important railway junction, and has railway workshops and coal-mines. Pop. 19,200.

Norns, in Scandinavian mythology, is the name given to three maidens who symbolise the past, present, and future, and are called Urd, Verdandi, and Skuld. They weave man's destiny and are also occupied in watering the root of Igdrasil, the tree of life, by means of the Holy Urðar Fount.

Norona, Fernando de, see FERNANDO DE NORONHA.

Norrboten, northernmost and largest co. of Sweden, bordered by Norway, Finland, and the gulf of Bothnia, and including a part of Lapland. There are iron mines at Gellivare, as well as many forests, the lumber being carried on the numerous lakes and rvs. Area 40,754 sq. m. Pop. 232,000.

Norris, Charles Gilman (b. 1881), brother of Frank N. (q.v.), Amer. author and editor, b. at Chicago; assistant editor of *Country Life in America*, 1903, and art editor of *American Magazine*, 1908-13. N. has written novels dealing with such themes as hereditary influences, eugenics, modern education, business morality, and women in business; they include *Anateur*, or the Education of Griffith Adams (1915); *Salt* (1917); *Brass* (1921); *Bread* (1923); *Pig Iron* (1925); *Seed* (1930); *Zest* (1933); and *Hands* (1935).

Norris, Frank (1870-1902), Amer. novelist, b. in Chicago. He attended courses at the univs. of California and Harvard, and while a student began his first ambitious realistic novel, *McTeague*, which appeared in 1899. When he left Harvard in 1895 he became a newspaper correspondent in S. Africa, where he was stricken with fever, and the results of this so weakened his constitution that he d. seven years later. N. was something of a mystic, contemplating the 'elemental passions' which he transmitted to his characters, and he had an epic mind able to grasp the spirit of America. He planned to write a trilogy on the battle of Gettysburg. This work was never written, nor was the last part, *The Wolf*, of his 'Epic of the Wheat,' of which the first two parts, *The Octopus* and *The Pit* appeared in 1901 and 1902 respectively. The second vol. of this

trilogy, *The Pit*, had an enormous vogue in its day. It dealt largely with the speculation in grain in the Chicago wheat pit. His Californian novels are *Moran of the Lady Letty* (1898); *Blix* (1899); *McTeague* (1899); and *A Man's Woman* (1900). He also wrote a critical work, *The Responsibilities of the Novelist* (posthumously, 1903).

Norris, John (1657-1711), Eng. philosopher and poet, b. at Collingborne-Kingston, in Wiltshire. He was rector of Bemerton church, near Salisbury, for twenty years. He was an idealist and a student of Plato and Malebranche. His pub. works include *Poems and Discourses occasionally written* (1681); *A Collection of Miscellanies* (1687); *An Account of Reason and Faith in relation to the Mysteries of Christianity* (1697); *An Essay towards the Theory of the Ideal or Intelligible World* (1701-4); and *A Philosophical Discourse concerning the Natural Immortality of the Soul* (1708). He also trans., in collaboration with Francis Digby, Xenophon's *Kipov Ilaenia* or *The Institution and Life of Cyrus the Great* (2 parts, 1685). An ed. of his poems, ed. by A. B. Grosart, was pub. in 1871. See F. J. Powicke, *A Dissertation on John Norris, of Bemerton*, 1894, and F. I. MacKinnon, *The Philosophy of John Norris of Bemerton*, 1910.

Norris, Sir John (c. 1547-97), Eng. soldier, a son of Henry N., baron N. of Rycote. He served as a volunteer under Adm. Coligny in the Fr. civil wars and in the disastrous undertaking of the earl of Essex to colonise Ulster. N., in a vain effort to improve the fortunes of Essex, advanced against the Scottish allies of the Irish in the is. of Rathlin and massacred the islanders who had all taken refuge in the castle there. He served in the Low Countries from 1577 to 1585 at the head of another party of Eng. volunteers fighting on behalf of the states-general in their revolt against their Sp. rulers. N. showed exceptional prowess in the relief of Steenwyk, which was besieged by the Spaniards under Count von Rennenberg. He was sent again to Ireland in 1585, but this did not offer a wide enough field for his ambition. The news that the Spaniards were besieging Antwerp aroused all his ardour on behalf of his former allies and he returned to the Netherlands in 1588 as ambas. In the following year he commanded, with Drake, the fleet that ravaged the coasts of Spain and Portugal, and in 1591 he served Henry IV. of France in his conflict with the League in Brittany. N. returned to Ireland (1597) to aid in reducing Tyrone. After fighting and negotiating with the O'Neills in Ulster and warring in Connaught, which he failed to pacify, he asked to be recalled. This was refused but he was superseded in his military command. There is a monument to him in the church of Tatton, Cheshire.

Norris, Sir John (1660?-1749), Brit. admiral. He distinguished himself under Shovell in the battle off Malaga (1704) and in the taking of Barcelona in 1705, for which services he was knighted, as well as receiving a sum of 1000 guineas. In

1739 he was appointed admiral and commander-in-chief of the Eng. fleet. He retired from active service in 1744.

Norris, Kathleen (née Thompson) (b. 1880), Amer. novelist, b. at San Francisco; married Charles Gilman N. (q.v.), 1909. Author of *Mother* (1911); *Saturday's Child* (1914); *Sisters* (1919); *The Sea Gull* (1927); *My California* (1933); *Heartbroken Melody* (1938). The wholesome if sentimental preoccupation, with little domestic comedy or tragedy, is the keynote of all her novels.

Norristown, bor. of Montgomery co., Pennsylvania, U.S.A., on the Schuylkill R., 18 m. N.W. of Philadelphia. There is a good trade in textiles, and important iron works, screw factories, brick works, and granite and marble quarries. Pop. 38,100.

Norrköping, tn. and port of Sweden in Östergötland, 113 m. from Stockholm, on both banks of the R. Motala. The tn. is modern in appearance. There are paper, textile, and cotton mills as well as ship-building yards. Pop. 78,300.

Norrland, see under SWEDEN.

Norse Languages. This group of languages, also known as Scandinavian or N. Germanic, is a sub-branch of the Germanic main branch of the Indo-European (q.v.) family of languages. Norse may be subdivided into three periods: (1) Primitive or Early Norse, termed in Scandinavian languages *urnordisk*, spoken till c. A.D. 700 in central and S. Scandinavia, in Denmark and N. Slesvig, and partly also in Finland and Estonia. This language is preserved in about 100 runic inscriptions (see under RUNES) and several hundred loan-words penetrated into the Finnish and Lappish languages. It appears to have been fairly homogeneous throughout the whole ter. Its nearest relation was Gothic (q.r.), and both groups are still considered by some scholars as forming a linguistic main group, termed E. Germanic, whereas the other Germanic groups of languages (including Eng. and Ger.) were called by these scholars W. Germanic. This subdivision, however, is nowadays rejected by the experts. In the first and second centuries A.D. Primitive Norse began to differentiate from the other early Germanic dialects, but it still preserved the early Germanic vowels and endings. (2) The second main period, known as Viking Norse (A.D. 800–1100) is the period of vital phonetic changes and of the development of the various dialects. Already in the eighth century Norse had undergone a considerable transformation, and at the end of this century Primitive Norse must be considered as non-existent, although the Scandinavians themselves still considered their language (then called *Donsk tunga*, 'Danish tongue') as one and the same. At that period, however, the Norse stock of phonetic sounds reached between thirty and forty, and therefore the common Teutonic runes became inadequate to represent all the sounds. Therefore it became the habit to represent different but allied sounds (such as k and g or t and d) with the same rune, and owing to this confusion of spelling some of the

runes began to fall into disuse: from about A.D. 800 a system of sixteen runes (reduced the original twenty-four) came into use: these are known as the Nordic or Scandinavian runes (see under RUNES). At that period Norse seamen, the Norsemen or Northmen, known as Vikings, or 'sons of the fiord,' descended from the coasts of Denmark, Norway, and Sweden, to ravage and plunder on the N. seas and off the coast of Great Britain. By the middle of the ninth century they were gaining their spoils as far S. as the waters of the Mediterranean (there and in France they were called Normans); in the far N.W., and perhaps in America (named by them Vinland); and in the S.E. they successfully fought against the Slavs of Novgorod and founded a new Russian monarchy about A.D. 862. Owing to this extraordinary territorial expansion, the Norsemen brought their dialects to the Orkney Is. and the Shetland Is. (where they were spoken from A.D. 800 to A.D. 1800), the Hebrides and the Isle of Man (800–1450), N. Scotland and parts of Ireland (800–1250), the Faeroes, Iceland, and Greenland, E. England (Northumbria, E. Anglia, and 'the five Danish boroughs': 875–1175), Normandy (900–1100), parts of Russia (862–1300?), and so forth. This territorial expansion certainly contributed to the further differentiation of the language, which we can study in the numerous runic inscriptions (see under RUNES), and the Scandinavian literature which was then arising. About A.D. 1000, with the definitive introduction of Christianity, the difference between W. Norse (Norway and its dependencies, including Iceland) and E. Norse (Sweden, Denmark, and their colonies) was already marked. Generally speaking, W. Norse preserved more primitive forms. The eleventh century witnessed the development of the sub-dialects of W. Norse into Norwegian (q.v.) and Icelandic (q.v.) and of E. Norse into Swedish (q.v.) and Dan. (q.v.). (3) While the N. L. of the first two periods are mainly preserved in runic inscriptions, the third period, called *Litterary Norse*, c. A.D. 1100–1500, is the period of the great Early Scandinavian literature. Mention may be made of the Icelandic sagas, the great prose epic, celebrating the *sigr-olda*, the epoch of the original colonisation of Iceland, c. 890–1030, and composed in the twelfth and the thirteenth centuries. During the third period the N. L. fully developed into the modern Scandinavian languages, each of them having various dialects. These can be classified in the following groups: (i.) the dialects of Iceland and Greenland; (ii.) the dialects of the Faeroe Is.; (iii.) the N. Scandinavian group (N. Norway and N. Sweden); (iv.) the W. Norwegian group; (v.) Middle Swedish; (vi.) the dialects of the is. of Gotland; (vii.) S. Scandinavian, including S. Sweden and Bornholm, the Dan. is., and Jutland and N. Slesvig.

Norsemen, in the strictest sense of the word, denotes the early dwellers in Norway; but the application of the term is sometimes extended to all Scandinavia. Between, say, 780 and 850 the hunting

economy of N. was strained, and emigration on a large scale took place. This factor was responsible for the Norse invasions of Europe which began on the E. coast of England in the year 787. Known to the Eng. as 'Dunes,' they were almost subdued by Alfred the Great; but they eleventh century, under Canute. It was at the end of the eighth century that they reached the Shetlands, Orkneys, and Hebrides. In Ireland they were also very powerful, and about 840 were masters of most of the northerly part of that country, founding their kingdom of Dublin. They reached the Faeroe Isles and Iceland about the end of the ninth century, and from Iceland visited Greenland and thence travelled in the eleventh century to N. America. They also pillaged the land of the Frisians and Flanders. In 843 they estab. themselves on the R. Loire, and a few years later had planted camps on most of the Fr. rivs. They obtained possession of Paris in 845 (sacking the city), and again on three later dates. In 859 and 860 they sailed into the Mediterranean Sea, attacking Spain and the is. near and settling on the R. Rhône. A short time after they arrived in Italy, and continued to plunder tns. In the year 912 Rollo was made by the Fr. king the owner of the duchy of Normandy (q.v.); it was from this that the future conquerors of England had their beginning. But in the S. regions, the true N. became absorbed into the alien race. See G. B. Depping, *Histoire des expéditions maritimes des Normands et de leur établissement en France au dixième siècle*, 1826; O. Delare, *Les Normands en Italie*, 1883; P. B. du Chailly, *The Viking Age*, 1889; C. F. Kearny, *The Vikings in Western Christendom*, A.D. 799 to A.D. 889, 1891; I. Fischer, *Die Entdeckungen der Normannen in Amerika*, 1902; Katharine F. Boult, *Asgard and the Norse Heroes* (Everyman's Library), 1903, 1914; A. W. Brögger, *Ancient Emigrants*, 1929; T. D. Kendrick, *A History of the Vikings*, 1930 (with good selective bibliography); and T. C. Lethbridge, *Merlin's Island*, 1948.

Norte de Santander, dept. of Colombia, lying in the N.E. with Venezuela to the E., the dept. of Magdalena to the N. and W., Santander to the S.W., and Bovaca to the S. The cap. is Cúcuta. Area 8295 sq. m. Pop. 409,700.

North, Eng. family, among whose prominent members are: *Edward N.*, first Baron N. (1496-1564), chancellor of the Court of Augmentation, who was raised to the peerage in 1554. *Sir Thomas N.* (1535-1601), a man of letters, chiefly distinguished for his trans. of Marcus Aurelius and Plutarch's *Lives*, which latter work was largely drawn upon by Shakespeare. *Francis N.*, first Baron Guilford (1637-85), a lawyer, solicitor-general, 1671; attorney-general, 1673; chief justice of common pleas, 1675-82; lord chancellor, 1682; raised to the peerage, 1683. *Sir Dudley N.* (1641-91) (q.v.), one of the few important exponents of free trade before Adam Smith. *John N.* (1645-83), prof. of Gk. at Cambridge, 1672; prebendary of Westminster, 1673; master of

Trinity College from 1677 until his death. *Roger N.* (1653-1734), a lawyer, the author of *Lives of the Norths* (Francis N., Sir Dudley N., and Dr. John N.), an Eng. classic (issued 1742-44), collected and ed. by Henry Roscoe in 1826 and by A. Jessopp (including Roger N.'s autobiography) in 1890. *Frederick N.* (q.v.), second earl of Guilford.

'*North*', Christopher (Scottish author), see WILSON, JOHN.

North, Sir Dudley (1641-91), Eng. economist, son of Dudley, fourth Lord N. He made a fortune in trading with the Levant and subsequently became a commissioner of customs and entered Parliament when, according to his brother, Roger N., he assumed the place of 'manager for the Crown in all matters of revenue.' As an economist he is remembered by his *Discourses upon Trade, principally directed to the cases of the interest, coinage, clipping and increase of money* (pub. anonymously in 1691). This work did not attract notice on its pub. nor does it seem to have been used by subsequent political economists. But it was ed. by J. R. McCulloch for the *Select Collection of Early English Tracts on Commerce*, printed by the Political Economy Club, London, in 1856. N. is highly praised by Wilhelm Roscher (q.v.) who includes his name among those who in the seventeenth century gave England the lead in Europe. Roscher points to the similarity of N.'s work to Adam Smith's classic and the tract does in fact anticipate Adam Smith's doctrines and those of the earlier free trade school to a marked degree, while being free from the prejudices and fallacies of the mercantile system (q.v.).



LORD NORTH

North, Frederick, second Earl of Guilford, better known as Lord North (1732-1792), Eng. statesman, entered Parliament in 1754, and was a junior lord of the Treasury from 1759 to 1766, in which year he became joint-paymaster of the forces. In 1767 he became chancellor of

the exchequer and leader of the House of Commons in the Grafton administration, and three years later he became Prime Minister. In that high office he acted as the mouthpiece of the king, who ruled the House of Commons by a group of 'King's Friends,' and, by appeals to his loyalty, induced N. to carry out his will. N. was opposed to the Amer. war, but allowed the king to influence him against his better judgment. He resigned in March 1782 but with Fox formed a gov. which endured from April to Dec. 1783, after which he did not again hold office. He succeeded to the earldom in 1790. An able financier, he was a weak man, and responsible for much of the trouble that arose in the earlier years of the reign of George III. See R. Lucas, *Lord North, Second Earl of Guilford, 1732-92*, 1923, and life by W. B. Pemberton, 1938.

North, Sir Thomas (1535?–1601?), Eng. translator, second son of the first Lord N., is said to have studied at Cambridge. He entered Lincoln's Inn in 1557, but devoted himself to literature rather than to law. He is best known by his classic trans. of Plutarch's *Lives of the Noble Grecians and Romans*, from the Fr. of Amyot, who himself had added charm to Plutarch's pedestrian style. N.'s trans. is in a vivid, dramatic, idiomat. Eng. and is a masterpiece beyond either Amyot or Plutarch. It was the repository from which Shakespeare drew his knowledge of ant. hist. in *Antony and Cleopatra* and *Coriolanus*. N.'s language is often followed. Another trans. was from an It. version of an Arable book of fables, and bore the title *The Morale Philosophie of Doni*.

North Adams, city of Berkshire co., Massachusetts, U.S.A., on the R. Hoosac, 52 m. N.W. of Springfield. It carries on cotton and woollen manufs. Pop. 22,200.

North Africa, see under AFRICA; also CYRENAICA; LIBYA; MOROCCO; TRIPOLITANIA; TUNIS.

North Africa, Second World War Campaigns in, see AFRICA, NORTH.

Northallerton, mrkt. tn. and cap. of N. Riding of Yorkshire, 40 m. N. of Leeds. It is the site of an old Rom. camp, and All Saints' church dates from the twelfth century. The remains of a Carthusian priory are near by. Leather goods and engineering products are made. Pop. 7000.

Northam: 1. Par. of Devonshire, England. It is on the Torridge, about a mile from Bideford, and includes the watering place, Westward Ho. There are golf links on N. Barrows. Pop. 6000. 2. Tn. in York co., W. Australia, in the Avon valley, 86 m. N.E. of Perth. It is a junction for the S. line to Albany, and the centre of a rich farming dist. Pop. 4700.

North America (Geology; Archaeology; Ethnology).

Geology.—The oldest part of N. A. lies to the E., the dists. of New England, N. New York, and the Blue Ridge being the earliest parts of the continent to rise above the sea. The dist. is chiefly floored with Archaean formation where it is associated with Cambrian and Silurian beds. The

Adirondack Mts. and the Appalachian Mts. are surrounded by Cambrian and Silurian formations. Scattered here and there are patches of Jura-Trias, some of which contain large deposits of coal. These areas widen further northwards, similar phenomena being found in the Hudson valley. There is also a carboniferous formation, loaded here and there with anthracite coal deposits. Bordering Lake Superior are areas of Algolian formation in which vast iron-ore deposits are found. Towards the Atlantic are soft Tertiary beds which trend southwards to Florida. In the Appalachian valley are alternate beds of Algolian, Cambrian, Silurian, and Devonian deposits, bearing evidence of considerable erosion. The Mississippi valley is floored with carboniferous layers containing large quantities of coal, and in S.E. Missouri are extensive Silurian areas holding iron and zinc. Of more recent formation are the great plains of N. A., composed mainly of Cretaceous and Tertiary beds, the oldest formation being Oklahoma, where Jura-Trias predominate. That remarkable region the Cordilleras, reaching through the Rocky Mts. group, presents all geological stages from Silurian to Tertiary. The Sierra Nevada is a monoclinal range descending westwards to California, most of it being granite. In anc. times the N. part of the continent was buried under ice during the movement of a great glacier from the N. Traces of this exist as erosion in Canada and deposition in the U.S.A. The great prairies of N. A. are composed of transported soil, mainly loess (g.r.), and form part of a great belt which reaches through Europe to Russia, thence from Turkestan to China, reappearing in N. A. Wind played an important part in the origin of this belt, attacking the finer elements of glacier débris and depositing them over a wide area, where they became modified by water.

The chief feature of Canadian geology is the great area known as the Canadian or Precambrian Shield or the Laurentian Plateau (see LAURENTIAN ROCKS). This shield is underlain by formations of the Precambrian age, which occupy nearly the whole of the country E. of a line joining Lake Winnipeg and Great Bear Lake, excepting the Maritime Provs., the S. of Ontario and Quebec, and a part of Ontario adjacent to the S. coast of Hudson Bay. The Precambrian rocks include the oldest known geological formations. Surrounding this Precambrian area is a wide extent of flat-lying sedimentary formations of Paleozoic, Mesozoic, and Cenozoic age. As one approaches the Atlantic and Pacific coasts, the flat-lying sedimentary series yield to great assemblages of folded sedimentary and volcanic rocks pierced by granite bodies and forming the Appalachian system of mts. on the E. and the Great Cordillera on the W. In the extreme N. an analogous mt. range stretches from Greenland westward into Ellesmere Is. The Precambrian formations are prolific in mineral deposits of great number, variety, and extent. They occur generally at or near the contact

of the intrusives and the intruded rocks, and among them are the gold deposits of Porcupine and Kirkland Lake, associated with intrusions of porphyry, the silver deposits of Cobalt, S. Lorrain, and Gowganda, associated with diabase sills, the vast nickel-copper deposits of Sudbury, associated with norite, the auriferous copper sulphides of W. Quebec, the copper-zinc sulphides of Flin Flon and the iron ores and iron pyrites of Ontario; in the Grenville-Hastings area are found deposits of galena, mica, graphite, feldspar, magnesite, kaolin, molybdenite, talc, and apatite.

Archaeology.—The first significant discovery of archaeological remains in N. A. was in 1902, when a skeleton was unearthed at Lansing, Kansas, and in Florida human remains have been found, accompanied by objects of human handiwork, but no definite age has been assigned to these finds. Mineralised bones were discovered near Osprey, Manatee co., in 1880. The features of the facial bones bear close resemblance to those of Florida Indians. Some remains found near Nebraska, identified as the Nebraska Loess man, were found in 1906, accompanied by flint implements. Considerable archaeological finds were discovered in the Los Angeles area, including a number of animal bones of the Quaternary period, and in 1914 a female human skeleton bearing similarity to the Californian Indian was found. Pleistocene remains were unearthed between 1913 and 1916 near Florida, including fossilised plant remains and vertebrate fossils. Perhaps the most complete Pleistocene skeleton yet found is that of the Lone Wolf Creek, Colorado. A similar discovery was made near Folsom, New Mexico, in 1925. The Field Museum expedition in 1931 found traces of three distinct cultures at Lowry Ruin, Colorado. The walls show fragments of painting in black and white, and date back 3000 years, having been covered for at least 1000. Prehistoric designs representing sun, rain, lightning, and clouds are apparent, and masonry and anct. Indian tribe. An imperial archaeological survey of the Brit. Columbian coast was made in 1938, and much active research followed.

Ethnology.—The Indians of N. A. are said to have come originally from the E. hemisphere. Hitherto N. A. has yielded no paleolithic remains either of human beings or human implements. It is reasonable to assume that a migration took place from N. Asia via the Behring Strait. The theory claims some support by reason of the similarity in feature and speech in Eskimo types on both sides of the strait. Indeed Paleo-Asiatic tribes such as the Chukchee and Yukaghin are markedly similar to the Amer. types found among the Dene and Haida tribes, and a Paleo-Asiatic link is pointed out by some authorities with the Amer. Indians (see AMERICAN INDIANS). In E. Siberian races the point of resemblance is greatest.

For geography, climate, products, manuf., forms of gov., hist., etc., see ALASKA; CANADA; UNITED STATES OF

AMERICA; and articles on the provs. and states of these countries.

See A. V. Kidder, *South-west Archaeology* (Pecos Excavation), 1924; W. R. Kermaek, *New Geography of the World*, 1930; G. J. Müller and A. E. Parkins, *Geography of North America*, 1934; R. Ruedemann and R. Balk, *Geology of North America*, 1939; S. Northev, *The American Indian*, 1940; and the publs. of the U.S. Geological Survey. There are details of recent work in the Digest of *American Journal of Archaeology*, of which vol. II. was pub. in 1947.

North American Indians, see AMERICAN INDIANS.

North American Native Languages. Among the better known larger groups of languages spoken in N. America are Eskimo (now considered by some scholars as a branch of the Ural-Altaic linguistic family (q.v.), Athabascan, Shoshonean, Algonkin, Caddoan, Iroquois, Muskogean, and Siouan, all of which are considered as Amer. Indian or Amerind, or 'Red Indian' languages.'

The Eskimo, or Innuitt, occupy more than 5000 m. of seaboard, from N.E. Greenland to the mouth of the Copper R. in W. Alaska. The numerous Eskimo dialects (respectively spoken in Greenland, Kuskoklvin, Labrador, Baffin Land, the Aleutian Is., and so forth) differ very widely, especially in their vocabularies, and employ different alphabets. The Athabascans (or Athabascans), subdivided into two branches, the N. (Déné or Tinne) and S. (Navaho, Apache, Hupa), once occupied a wide area in the N.W. from the Rockies almost to Hudson Bay, small detachments spreading westwards to Washington, Oregon, and California, and in the S.W. (Colorado, New Mexico, and Arizona). Navaho is one of the main languages; it is spoken by some 25,000 people, living in N. Arizona. Hupa is spoken in the ter. lying on the lower Trinity R. in N. California. The Shoshoneans were mainly centred in the region of the Rocky Mts. The Algonkins are much better known; their main linguistic branches are Blackfoot or Siksika, Micmac, Cheyenne, Arapahoe, Cree, which was reduced to writing about 300 years ago, Chippewa or Ojibway, Fox, and Lenape and some other languages, which are less important.

The Caddoans live mainly on the Red R. in Louisiana, along the rive. of N.E. Texas, in Kansas, and Nebraska. This linguistic group consists of four major languages, Caddo, Pawnee, Wichita, and Kitai or Kichai. The term Iroquois was originally applied to a group of five, and later six, tribes (Mohawk, Oneida, Onondaga, Oneida, Cayuga, Seneca, Tuscarora), at the time united in a strong confederacy. Cherokee is now the main Iroquoian language; the Cherokees formerly lived in what is now N. Georgia and N. Carolina, but were moved to Indian ter. in 1838-39; they employed their own script, a syllabary which was the most developed writing ever created by an Amer. native. Huron and Attawandaron are extinct; some other languages, such as Wyandot,

are still spoken. Muskogean ter. extends along the riva, flowing into the gulf of Mexico parallel to the Mississippi. The following are the main languages belonging to this group: Muskogee or Muskokee, Creek, Seminole, Chickasaw, and Choctaw. Winnebago (Minnesota and Wisconsin) is one of the oldest Dakota languages. The Assiniboin or 'Stone Sioux' is another branch; it separated from the main stock about 300 years ago. An important dialect, originally spoken by a numerous tribe inhabiting Missouri and Arkansas, it is nowadays spoken by only 2200 people living in Oklahoma.

Pacific Areas.—The ethnical hist. and linguistic situation of the native pop. of the 'Pacific slope' are entirely different from those of the rest of N. America. The following are some of the main languages spoken in the extreme W.: Chinook, which embraces a number of closely related dialects originally spoken on both sides of the Columbia R. from the Cascades to the sea; Tillamook, spoken on the Oregon coast S. of the Columbia R.; Kutenai, spoken in the area from about 50° N. lat. to N. Idaho and Montana. Other languages spoken in Brit. Columbia belong to the Wakashan group; there are three main dialects, each divided into sub-dialects differing in phonetics and vocabulary, Kwakutl being one of them. The Salish or Flathead tribes of the coast and the Kalispel constitute the Salishan linguistic group. Tsimshian and Nootka are spoken on the Skeena R. in N. Brit. Columbia and on the is. further to the S. Lakelma was spoken in the S.W. of the state of Oregon. Maidu or Pujunan, comprising various dialects, is spoken in N.E. California; Diegueno is spoken in S. California; Pima is spoken in S. Arizona by a semi-civilised tribe, and Zuñi is now spoken only by 2000 people on the Zuñi reservations in New Mexico. See under LINGUISTIC FAMILIES; see also LANGUAGES, CLASSIFICATION OF; MEXICAN (AND CENTRAL AMERICAN) NATIVE LANGUAGES; SOUTH AMERICAN NATIVE LANGUAGES.

'North American Review,' critical review, reputed to be the oldest magazine in the world. It was the lineal successor of the *Monthly Anthology*, which was begun by Phineas Adams in 1803. The first number was pub. by Wm. Tudor, its first editor, in 1815. Practically every notable Amer. writer, together with some of the greatest lights of contemporary thought in England, at one time or another contributed to its columns. One of its most celebrated editors was James Russell Lowell (1862-72). It claims to be the recognised channel in America for the most comprehensive discussions of important public questions: a character which it acquired under the editorship of Allen Thorndyke Rice, who purchased it in 1877, and was editor for twelve years. Rice drew his contributions not, as his predecessors had done, from Amer. writers only, but from every part of the world. It is pub. monthly. The offices are at 9 East 37th Street, New York.

Northampton, Spencer Joshua Alwyne Compton, second Marquess of (1790-1851), Eng. politician, b. in Wiltshire. He was associated with Wilberforce in the anti-slavery campaign, and assisted Sir James Mackintosh in his efforts towards the reform of criminal law. From 1838 to 1849 he was president of the Royal Society.

Northampton, William Parr, Marquess of (1513-71), was the brother of Catherine Parr, the sixth wife of Henry VIII. He was created earl of Essex in 1543 and marquess of N. in 1547. He played an important part during the reign of Edward VI., supporting the cause both of Somerset and Northumberland. On the death of Edward VI. he favoured the accession of Lady Jane Grey, and as a consequence was condemned to death, but the sentence was afterwards commuted to the forfeiture of his titles and estates. On the accession of Elizabeth he was again taken into favour and was created marquess for a second time in 1559.

Northampton: 1. Co. tn. of Northamptonshire, England, a mrkt. tn. and parl. co., and municipal bor., on rising ground on the l. b. of the Nene, 67 m. N.W. of London by railway. In the centre of the tn. is a spacious market square. The prin. edifices are the shire hall, the grammar school, the tn. hall, the numerous churches, sev. of which are unusually interesting, as St. Peter's, a restored and beautiful specimen of enriched Norman, and St. Sepulchre's, one of the very few round churches in the empire, and supposed to have been built in the twelfth century. N. is the seat of a Rom. Catholic bishop. Boot and shoe making is the staple industry. Leather, hosiery, and lace are manufactured. Iron and brass foundries are in operation, brewing is carried on, and there is printing, brick making, and the manuf. of plastics. N. returns one member to the House of Commons. N., a very anct. tn., was held by the Danes at the beginning of the tenth century, and was burned by them in 1010. After the Conquest it was bestowed on Simon de St. Liz. In the seventeenth century it suffered flood and fire. Pop. 19,500. 2. City in Hampshire co., Massachusetts, U.S.A., on the r. b. of the Connecticut R., 8 m. N.W. of Holyoke. It has manufs. of silk, brushes, cutlery, etc. There are the Smith College for women, the Burnham School for girls, and the Clarke School for the deaf in the city. Pop. 24,700. 3. Post tn. in the Victoria dist. of W. Australia, 262 m. N.N.W. of Perth. Pop. 1200.

Northamptonshire, midland co. of England. The surface is mainly level or broken with low hills, and the scenery is beautiful and well wooded, the co. being famous for its trees. It includes part of the Fen country (q.v.), what is known as the 'soke' of Peterborough being land reclaimed from the Fens. The prin. riva. are the Avon, Nene, Welland, Cherwell, Leam, and Ouse. The Grand Union Canal crosses the co. Ironstone, limestone, and clay are worked, and a

particular kind of building-stone known as Weldon or Stamford marble. The mild climate and level surface, in addition to a rich soil, are admirable for agriculture, and almost the whole of the co. is under cultivation. Farming of all kinds flourishes, wheat and barley being the principal crops, while cattle and sheep are reared extensively. Apart from agriculture the main industries are the iron works carried on at Kettering, Wellingborough, etc., and the manuf. of boots and shoes, Northampton being the centre of the trade for England. Since 1933 iron ore has been quarried at Corby (q.v.) and iron and steel foundries estab. The co. is divided into four co. constituencies and one bor. constituency (the co. tn.), each returning one member to Parliament.



D M Lish

SULGRAVE MANOR, NORTHAMPTONSHIRE

The ancestral home of the Washington family.

N. was originally included in the Mercian kingdom, and was part of Tostig's earldom in the eleventh century. At Harrington has been excavated a small fortified homestead of the early Iron Age. Earthworks and Roman remains have been found and Watling Street and Ermine Street both cross the co. In 1215 the barons besieged Northampton Castle, held by King John, and in 1264 the castle was wrested from the younger Simon de Montfort by Henry III. Henry VI. was defeated at Northampton during the Wars of the Roses, and later the famous battle of Naseby (1645) took place in the co. There are few monastic remains, the most important being the abbey church of Peterborough (Medeshamstede), now the cathedral (Norman), commenced by Penda in 665; but there are some beautiful churches of Norman date. There are famous market crosses at Brigstock, Helpston, Higham Ferrers, and Irthingborough. The ruins of Fotheringay Castle, where Mary Queen of Scots was executed, are also in the co. The family of George Washington, first president of the U.S.A., originated at Sulgrave Manor in N., whence

his great-grandfather John Washington migrated in 1657. The area is 909 sq. m. Pop. 359,700. See J. Taylor, *Bibliotheca Northamptoniensis*, 1869; Victoria Co. History: *Northamptonshire*, 1908; W. Dry, *Northamptonshire*, 1920; S. H. Beaver, *Northamptonshire and the Soke of Peterborough* (ed. by L. D. Stamp), 1944; and A. Mee, *Northamptonshire*, 1945.

Northamptonshire Regiment. The 1st Battalion was originally the 48th (Northampton) Foot, and was raised in 1740; the 2nd Battalion was the 58th (Rutlandshire) regiment of Foot, raised in 1755. The 48th served first as marines and took part in the battle of Culloden (1746). The 58th had a fine record in the Peninsular war and also fought in the Crimean war, at Sebastopol, in S. Africa (1879), at Tirah (1897-98), and at the Modder R. in the S. African war. The 1st Battalion went out to the W. front as part of the 2nd Infantry Brigade, 1st Div. of the original B.E.F. in 1914, suffering very heavy losses in resisting the Ger. attack of Nov. 2, 1914, near Iloog Wood. The 4th Battalion (T.A.) took part in the Suvla landing in 1915 and later (1916) in the second battle of Gaza. Service or 'Kitchener' battalions of the regiment fought in the Somme battles of 1916, and were conspicuous in 1917 for their part in the defence of the Lombartzyde light-house. In the last year of the war they fought at Villers-Bretonneux, Bapaume, Epéhy, and in the Cambrai-St. Quentin battle. In the Second World War they fought in many of the most critical battles of the Burma campaign. In Italy other units were part of the Eighth Army (q.v.) and took part in many of the chief engagements from Sicily to S. Italy and in the battles N. of Bologna.

North Andover, tif. in Essex co., Massachusetts, U.S.A. The chief trade is in wool and machinery. Pop. 7500.

North Atlantic Treaty, signed on April 4, 1949, at Washington by the U.S.A., Great Britain, Canada, France, and the other 'Benelux' (q.v.) countries, by which the U.S.A. associated herself with the W. European countries in security arrangements for their common or mutual defence against possible aggression. The pact had its provenance in the hist. of the two years 1947-48 during which failure to come to terms with the Soviet Union and its satellites forced the W. countries to seek economic and security arrangements among themselves. For the terms of the pact and its evolution from the 'cold war' between the W. powers and Russia, the voluntary association of a 'W. Union,' the Brussels Treaty (1948) (q.v.), and the Vandenberg resolution urging the association of the U.S.A. with regional defence agreements, see EUROPE, History. - *Russian intransigence*, et seq. The N. Atlantic Council, at Washington, approved (Nov. 1949) the estab. of a committee under the treaty, which is to be responsible for advising the council on the financial and economic aspects of measures for the defence of the N. Atlantic area. The committee will co-operate closely with the N. Atlantic military organisation and par-

ticularly with the military production and supply board estab. by the defence committee. The committee's functions will also include consideration of plans for the mobilisation of economic and financial resources in time of emergency. The secretariat and working staff of the committee are to be located in London.

North Australia, *see* NORTHERN TERRITORY.

North Bay, tn. and watering-place of Ontario, Canada, on Lake Nipissing, 190 m. N. of Toronto. N. B. has foundries and machine shops, manufs. railway cars and ships, minerals, pulp and paper. There are gold and silver mines in the neighbourhood. Pop. 12,000.

North Berwick, seaside resort and royal burgh of Scotland in E. Lothian co., 22½ m. (by rail) E.N.E. of Edinburgh. It has become popular as a watering-place, having a good beach and fishing and two fine golf courses. It was made a royal burgh by Robert III.; the ruins of a Cistercian abbey founded by David I. are in the neighbourhood. One mile to the S. is the hill called N. B. Law, rising to 612 ft.; 3 m. to the E. of the tn. are the ruins of the fourteenth-century Tantallon Castle, whilst 2 m. to the S.W. is Dirleton Castle, built in the twelfth century. Pop. 3500.

North Borneo, British, *see* BORNEO, BRITISH NORTH.

North Brabant, prov. of the Netherlands in the S. of the country. Cattle is raised, wheat grown, and sugar-beet produced in the N.E. There are textile industries and the manuf. of incandescent lamps. Chief tn. is Hertogenbosch. Area 1920 sq. m. Pop. 1,168,000.

North Braddock, bor. of Pennsylvania, U.S.A., in Allegheny co., 9 m. S.E. by E. of Pittsburgh. There are manufs. of steel rails. Pop. 15,600.

Northbridge, tn. in Worcester co., Massachusetts, U.S.A., 11 m. S.E. of Worcester. It is engaged in the manuf. of cotton goods. Pop. 10,200.

North Bridgewater, *see* BROCKTON.

Northbrook, Earl of, *see* BARING.

North Cape, headland on the is. of Magerö, Norway. It is, with Knivskjærödde, which is slightly further N., the most northerly point of Europe, being in lat. 70° 11' N.

North Carolina (Tar Heel State or Old North State), S.E. Atlantic state of U.S.A. The coastal plain is fringed by a margin of swamps and shoals which are extremely treacherous to navigation. The largest of these swamps is known as Dismal Swamp. The Piedmont plateau region is bold and somewhat rugged in contour. The chief ranges of the Appalachian Mt. region are the Blue Ridge and the Unaka Mt. range. The highest peak of the Unakas is Mt. Mitchell (6711 ft.). The mts. of this region are for the most part clothed with dense forests. The scenery is exceptionally beautiful, Asheville being the most famous resort with a fine golf course. N. C. is exceptionally rich in minerals, which include clay products, mica, feldspar, barytes, talc, kaolin, asbestos, granite, monazite, zircon, columbite, wolframite,

etc. In 1946 mineral products were valued at \$20,428,000. The chief occupation is agriculture. Maize is the prin. crop (65,000,000 bushels in 1947). The chief cash crops are cotton, tobacco, and peanuts. Cultivation of cotton on 619,000 ac. in 1947 produced nearly 410,000 bales. N. C. leads usually in the production of tobacco (915,000,000 lb. in 1947), and of sweet potatoes. Also grown are peaches and *sorbo* syrup. The ann. lumber cut is about a billion feet, chiefly yellow pine. Tar and rosin are also flourishing trades. The state is second only to Massachusetts in cotton and textiles (183,000 workers), and leads in cigarette manufs. (70 per cent of the country's production). The manuf. of furniture, rayon, aluminum, and the processing of foods are also carried on. Fisheries in the state are valuable. The cap. of the state is Raleigh (47,000) and the chief port is Wilmington (33,400), the largest city being Charlotte (101,000). Other cities are Winston-Salem (79,800); Durham (60,200); Greensboro (59,300); Asheville (51,300), and High Point (38,500). The state is represented in Congress by two senators and twelve representatives. Its General Assembly has a Senate of fifty and a House of Representatives of 120 members, elected for two years. N. C. was one of the original thirteen states. The ter. was discovered by Amadas and Barlow in 1584, and a colony settled in Roanoke Is. in 1585-86, the famous 'vanished colony' which in 1587 was found to have disappeared without leaving a trace. The ter. was granted to various 'proprietors' by Charles I. and Charles II., but in 1728 the Crown resumed control. The pop. consists of over 99 per cent native-born Amer., of whom 27·4 per cent are Negroes. The percentage of illiteracy is still somewhat high, but is being rapidly reduced by compulsory attendance at the schools. There is the state univ. at Chapel Hill and Duke Univ. at Durham, endowed with \$15,000,000 by J. B. Duke, the cigarette millionaire, the college of agriculture and engineering at Raleigh, and the college for women at Greensboro. There are separate schools for white, coloured, and Indian children. There are twelve state-supported teachers' colleges, six white, five Negro, and one Indian. The area of the state is 52,426 sq. m., of which 3868 sq. m. are inland water. The pop., in 1940, was 3,571,623 (estimulated pop., July 1944, was 3,534,545). See R. D. Connor, W. K. Boyd, and J. G. Hamilton, *History of North Carolina, 1584-1912*, 1919; A. R. Newsome, *North Carolina Manual*, 1929; S. H. Hobbs, *North Carolina: Economic and Social*, 1930; H. T. Lefler, *North Carolina's History told by Contemporaries*, 1934; Federal Writer's Project, *North Carolina: a Guide to the Old North State*, 1939; and A. Henderson, *North Carolina, The Old State and the New*, 1941.

Northcliffe of St. Peter in Thanet, Sir Alfred Charles William Harmsworth, Viscount (1865-1922), Brit. newspaper proprietor; b. at Chapelizod, Dublin, eldest child of Alfred Harmsworth, a barrister of Eng. birth. He started in

Journalism as a reporter for the *Hampstead and Highgate Express*, and later he became assistant editor of *Youth*, a paper linked with the *Illustrated London News*. After an attack of pneumonia in 1883, he had to live out of London, and worked for Iliffe & Sons, Coventry. Saving about £1000, he returned in 1887 to London opening as a publisher at 28 Paternoster Square. On June 2, 1888, he pub. the first number of a snippet weekly, first called *Answers to Correspondents*, but soon merely *Answers*, modelled on the pattern of Newnes's *Tit-Bits*, begun 1881. He was assisted in this enterprise by his brother Harold Sidney, afterwards the first Lord Rothermere. In 1892 they were selling 1,000,000 copies weekly. In Aug. 1894 N. bought the *Evening News*, a Conservative paper. The same year he equipped the Jackson arctic expedition at his own expense. On May 4, 1896, he began pub. of the *Daily Mail*, a revolution in journalism from its inception, with ideas of make-up and presentation of news-items adapted from current Amer. journalism. One prov. newspaper after another was acquired by Harmsworth. Innumerable, as years went by, were the subsidiary Harmsworth Jours. pub. by Amalgamated Press. In 1904 he was made a baronet, and in 1905 he became Baron N. In 1906 he and his brother acquired forests in Newfoundland, in order to make their own paper. In 1908, with the utmost precaution to insure secrecy of the negotiations, he became proprietor of *The Times* (see H. Kitchin, *Moberley Bell and 'The Times'*); he retained the controlling interest until his death. Through the *Daily Mail* he had been popularly supposed to have made the S. African war; and in the First World War he continually offered instructions and awarded commendation and rebuke but he declined the Ministry of Air when Lloyd George offered it to him in Nov. 1917. He was made a viscount that year, and became director of propaganda in enemy countries, in which work he was extremely successful. From the end of 1918 he suffered much in health, and his mind was affected by his malady. He went for a tour round the world in 1921, but received no benefit. He d. in London, 1922. He was married, but left no issue.

That N. was a great journalist is not open to doubt. His aim was not so much to 'amuse' as to humanise and extend the scope of the daily newspaper. He was the first to see that women, as well as men, could be interested in a newspaper. A notable quality of N. was his prescience. He foresaw the possibilities of aviation more clearly than most, except the experimental pioneers themselves and the military advisers. His part in the First World War in moulding and interpreting public opinion was often of importance. But in Fleet Street his name will probably be mainly associated with raising the status of the ordinary journalist. It was well said that nothing unclean or indecent was allowed in any of the Jours. under his control. The point is a minor one, but it is one that could not be

made of the older school. Through his numerous pubs. N. exercised tremendous influence and was one of the most dynamic personalities of his generation in Great Britain. See Sir M. Pemberton, *Lord Northcliffe, a Memoir*, 1922; M. Wilson, *Lord Northcliffe*, 1927; H. Hamilton Fyfe, *Northcliffe: an Intimate Biography*, 1930; T. Clarke, *My Northcliffe Diary*, 1931; and Sir J. A. Hammerton, *With Northcliffe in Fleet Street*, 1932.

Northcote, Henry Stafford, Baron Northcote of Exeter (1846-1911), Eng. statesman, b. in London, was the second son of Sir Stafford Henry N., first earl of Iddesleigh. He entered the Foreign Office in 1868, and on various commissions acquired considerable experience. In 1877 he became private secretary to his father, then chancellor of the exchequer, and in 1880 became a member of Parliament. He held minor appointments until 1900, when he was raised to the peerage and made governor of Bombay, in which position he greatly distinguished himself. The Commonwealth of Australia was formed in 1901, and three years later N. went out as governor-general.

Northcote, James (1746-1831), Eng. painter, b. at Plymouth. In 1773 he began his studies under Sir Joshua Reynolds (of whom he wrote a life, pub. 1813) and at the Royal Academy schools. He went to Italy in 1777, and on his return to England he became famous as a portrait painter. In 1786 he was elected associate of the Academy, and his historic picture, 'The Young Prince inured in the Tower,' was completed in that year. This was followed by 'The Burial of the Princes' and 'The Death of Wat Tyler.' 'The Entombment' and 'The Agony in the Garden' are among his last works. Much information about N. as an individual is contained in articles pub. in 1826 by Wm. Hazlitt in the *New Monthly Magazine*; these appeared in book form in 1830 as *Conversations with James Northcote Esq., R.A.* (new ed. by F. Swinnerton, 1919).

Northcote, Sir Stafford, see IDDESLEIGH.
North Dakota, N. central state of the U.S.A., bounded on the N. by Canada and known as the Northern State. The physical features are bold and simple. Three vast tablelands rise successively from E. to W. The Red R. flows through the northernmost of these tablelands, which has a mean breadth of 50 m. and a mean elevation of 900 ft. The second tableland has a mean breadth of 180 m. and a mean elevation of 1400 ft. The third and most westerly tableland is called the Coteau du Missouri, and covers half the state. This plateau is watered by the Missouri. The rainfall is low, and the winters cold but sunny. Devil's Lake, or Minnibaukon, in the N.E., has no outlet, and is salt. The valley of the Red R. is very fertile, and produces fine wheat crops. N. D. leads usually in the production of barley, spring wheat, rye, and durum wheat. Other important products are flax seed, potatoes, hay, oats, and maize. Horse and cattle raising flourishes. The mineral resources consist chiefly of

coal, in the Coteau du Missouri, and great lignite deposits. The co. seat is Bismarck (15,500); other cities: Fargo (32,600); Grand Forks (20,200); and Minot (16,600). The state sends to Congress two senators and two representatives. It has a Senate of forty-nine members elected for four years, and a House of Representatives of 113 members elected for two years. There is a state univ. and a state agric. college. Area 70,663 sq. m., of which 611 sq. m. are water. It was first settled about 1800. The state formed part of the Louisiana Purchase and remained for a long time unorganised. The part E. of the Missouri R. was attached to the ter. of Minnesota; the part on the W. to the ter. of Nebraska. Dakota was organised as a ter., 1861. N. D. was admitted as a state in 1889. Pop. (1940) 642,000 (a decrease of 39,000 since 1930). See C. Lounsberry, *Early History of North Dakota*, 1913; Z. I. Trinka, *North Dakota To-day*, 1919; L. F. Crawford, *History of North Dakota*, 1931, and *North Dakota*, 1938; and Federal Writers' Project, *North Dakota: a Guide to the Northern State*, 1938.

North Downs, see DOWNS.

North-East Passage, route, finally found by A. E. Nordenskiöld ('') in 1878-79, from Europe and the Atlantic through the Arctic Ocean round the N. coast of Asia to the Pacific Ocean.

North-East Polder, or *Noordoostelijke Polder*, area of Holland, consisting of part of what was once the Zuiderzee, now called IJsselmeer. Its reclamation, completed in 1942, has provided Holland with an additional 120,000 ac. of agric. land.

North-East Provinces, China, see MANCHURIA.

Norther, winter winds experienced in the gulf of Mexico and Texas regions. Cold N. or N.W. winds, often with snow, occurring in winter, the Northers are produced by a strong depression over the W. Caribbean Sea.

Northern Circars, The, see CIRCARS.

Northern Dialect, see under ENGLISH LANGUAGE, Middle English.

Northern Diver, Great, see LOON.

Northern Ireland, see IRELAND, NORTHERN; ULLSTER.

Northern Lights, see LIGHTS, NORTHERN.

Northern Nigeria, see NIGERIA.

Northern Pacific Railroad, with over 6750 m. of railway track, operates mainly in the states of Minnesota, N. Dakota, Montana, Idaho, Washington, and Oregon, with Pacific coast terminals at Seattle and Portland, and middle W. terminals at Minneapolis, St. Paul, and Duluth. The road was constructed under an Act of the U.S. Congress in 1865, and was completed in 1883. It does an enormous freight business, especially with cargoes of grain, timber, and mineral ore.

Northern Rhodesia, see RHODESIA.

Northern Territory, formerly *Alexandra Land*, name given to the N. portion of S. Australia, N. of 26° S. lat. and extending between 129° and 138° E. long. with a length of 560 m. The region formerly belonged to New S. Wales, but was annexed to S. Australia in 1863 and trans-

ferred to the Commonwealth in 1911. In 1927 the N. Ter. was divided, for administrative purposes, into N. Australia and Central Australia, the dividing line between these two ter. being 20° S. lat. By an Act of 1931 the whole of the N. Ter. was placed under one administrator. The coast was surveyed by Philip Parker King in 1818, and by J. C. Wickham and John Lort Stokes in 1838 and 1839. Port Darwin, the present cap., was discovered in the latter year. The interior was explored in 1855 by A. C. Gregory. Leichhardt visited the site of Port Essington after trying journey of 3000 m., during which he and his party were attacked by aborigines, and his naturalist, John Gilbert, was killed (1845). His route is marked by a procession of names which he gave to features that he discovered, amongst these being Calvert and Roper Rs., named after members of the party. Two years later Leichhardt embarked on his last fatal journey, whence neither he nor any of his companions returned. There is reason to believe that they met disaster somewhere in N. Australia. Arnhem Land has in recent years been explored by D. F. Thomson. He found that the native inhab. have been strongly influenced by Malay or Macassar visitors. Indonesian characteristics are preserved in vocabulary, ceremonial life, and material goods, such as the dugout canoe, smoking pipe, and calico. The low, flat coastline seldom reaches a height of 100 ft. Sandy beaches, mud flats, thickly fringed with mangroves, prevail. Sandstone, marl, and ironstone form the occasionally cliffy headlands. The sea front of more than 1000 m. is indented by bays and inlets and intersected by numerous rvs., of which the Roper R. is the chief. Many of the rvs. are navigable for considerable distances from their estuaries. Inland there is a general rise southwards to the 18th parallel where the higher lands form the watershed between the rvs. flowing northwards to the sea, and those forming the scanty supply of the interior system. Towards the centre of the continent the land over a wide area is of considerable elevation (1700 ft.) and there are several ranges, generally with an E. and W. trend.

The high hopes once centred on Port Essington came to nothing, for the place was too far outside the track of shipping going through Torres Strait, and little now remains of it or of the other one-time busy little settlements of Fort Dundas and Raffles Bay. The linking of S. Australia with Port Darwin owed much to the foresight of Charles Todd, superintendent of telegraphs of S. Australia; for it had been proposed by the cable company concerned, to make either Normanton or Burketown, at the head of the gulf of Carpentaria, the objective of the cable from Java; but Todd, to the great advantage of S. Australian interests, successfully urged the claims of Darwin instead and the Overland Telegraphic Line was completed under his guidance by Aug. 22, 1872. In the eighties some thousands of Chinese

and other aliens were employed on the railway construction works for the Palmerston Pine Creek Railway. This led to legislation in 1876 in Queensland restricting the employment of alien labour, the first phase of the subsequent national restrictive policy culminating in the White Australia ideal. This restrictive action by Samuel Griffith, attorney-general of Queensland, had a direct bearing on N. Ter. hist. for eventually S. Australia, yielding to the general public sentiment, abandoned the project of developing the ter. by any but white people.

Much of the country is desert, but near the coasts sugar-cane, cotton, and fruits are grown, and elsewhere pine, fig, and orange trees. But at present agriculture is insignificant and the peanut is the only crop which is marketed for export. N. Ter. is rich in mineral resources, though these have been but little developed until recent years. There is considerable activity in gold-mining near Tennant Creek. Other minerals worked include tin concentrates, wolfram, tantalite, and mica. Total value of minerals in 1936 was £A128,000; in 1948 the value was £A281,026. The immediate surroundings of Port Darwin consist of woodlands like those of the S. parts of Australia. Gum-trees shade the undergrowth. The scarlet banksia and yellow bottle-brush flowers and many other trees or shrubs vary the sombrely tinted vegetation. Graceful palms and thousands of ant-hills make up the tropical landscape. Among the birds are honey-eaters, butcher-birds, and brown hawks. There are extensive lagoons on the Ten-Mile plains on which grow milkwood trees and pandanus palm. Near the Ten-Mile are the so-called 'Cemetery Plains,' a swampy area of ant-hills. Heavily covered with scrub the undulating country stretches northwards and eastwards from the Ten-Mile. The jungle of N. Ter. is covered with a deep layer of dead and decaying vegetation. The giants of the jungle are wild fig, while parasitical creepers swath the trees, and immense leafy cables festoon the jungle. Bird life in the jungle is prolific—the Torres Strait pigeon, scrub turkey, fruit pigeon, and cockatoo. Horses, cattle, sheep, and pigs are reared. The ordinary types of native Australian fauna are found. Marsupials, birds, crocodiles, tortoises, snakes (non-venomous), and frogs abound. The white ant is a pest, and mosquitoes and sand flies are troublesome, especially in the wet season. Buffalo formerly existed in large herds. N. Ter. is potentially a great source of meat production with its 300,000 sq. m. of cattle-producing land; 2,500,000 head of cattle could be carried even without development. Communications for cattle transporting are a problem to be solved; the Federal Gov. has initiated a trunk route into the Kimberleys and the N.W. of the N. Ter. A regular demand is a vital necessity, and this may well be provided by the long-term agreements entered into with Australia by Britain.

The climate is tropical, the wet season lasting from Nov. to April; the ann.

rainfall is about 60 in. The S. part of the ter. is generally sandy with a small rainfall, but it can be watered by means of sub-artesian bores. Though the climate is tropical, it varies considerably over the whole ter. The proximity of the sea in the N. keeps it fairly equable in the coastal region, but further S. the climate is of a continental type, showing a great variation between the hottest and coldest months.

The chief is. off the coast of N. Ter. are Goulburn, Valentia, Tempilar's, Darch, Croker, and Melville. S. Goulburn has sea-is. cotton and chicken pearl-shell, and is suitable for coco-nut cultivation. Croker Is. is well timbered, Melville Is. (2400 sq. m.) has pearl fisheries. The first landing was effected on this is. at an unnamed point 10 m. N.E. of Cape Keith.

The prin. exports of N. Ter. are cattle, pearl-shell, and trepang. Value of commerce in 1947-48: Imports, £A1277,000; exports £A73,000. Mother-of-pearl shell was discovered in 1884 in Port Darwin harbour. The pearl-shell and trepang fisheries are valued at over £30,000.

The area of N. Ter. is 523,620 sq. m. The coast-line is 1040 m. in length. In 1888 the pop., exclusive of aborigines in the N. Ter., reached 7533; in 1929 the pop. excluding aborigines, was only 4470. The estimated pop. in 1947 was 10,870. The estimated number of aborigines (including half-castes) in the middle of 1917 was 12,200. Railways: Port Augusta to Oodnadatta (later extended to Stuart (Alice Springs), 292 m. from Oodnadatta and 981 m. from Adelaide). The terminus of the N. Australian Railway is at Birdum (316 m. from Darwin), while the Central Australia Railway extends as far N. as Alice Springs. Two new roads were constructed during the Second World War: Newcastle Water—Mt. Isa (Queensland) and Durwin—Alice Springs (970 m.). There is an airfield at Darwin. See M. Terry, *Across Unknown Australia*, 1925, and *Through a Land of Promise*, 1927; H. Basedow, *The Australian Aboriginal*, 1925; A. G. Price, *The History and Problems of the Northern Territory, Australia*, 1930; C. P. Conigrave, *North Australia*, 1936; C. T. Madigan, *Central Australia*, 1936; C. Chewings, *Back in the Stone Age: the Natives of Central Australia*, 1936; H. H. Finlayson, *The Red Centre*, 1930; W. L. Warner, *A Black Civilization: a Social Study of an Australian Tribe*, 1931; and D. F. Thomson, 'Arnhem Land: Explorations Among an Unknown People' (*Geographical Journal*, 1948-49).

Northern Union, Eng. rugby football union formed in 1893, to avoid the ban on professionalism within the Rugby Union, and renamed the Rugby League in 1922. See *further under FOOTBALL*.

Northfield: 1. Dist. of Worcestershire, England, a suburb and bor. constituency of Birmingham. There are manufs. of nails and other hardware products. Pop. 46,000. 2. Vill. of Washington co., Vermont, U.S.A., 35 m. from Burlington. Here is Norwich Univ., removed in 1866 from Norwich. 3. Tn. in Franklin co.,

Minnesota, U.S.A., 42 m. N.E. of Springfield. It is the bp. of Dwight L. Moody; it possesses a seminary and a training school, and is the rendezvous of the ann. summer conference of Christian workers. Pop. 2000.

Northfleet, tn. in the co. of Kent, England, 1½ m. W. of Gravesend. It is engaged in the manuf. of paper, chemicals, and cement. Pop. 16,400.

North Foreland, see FORELAND, NORTH AND SOUTH.

North Foreland, Battles off the, were three battles of the Dutch wars. The first battle commenced on June 2, 1653, between fleets commanded by van Tromp and De Ruyter on the Dutch side, and Monck, Deane, Penn, and Lawson on the Eng. During the first day's fighting Deane was killed, but Blake came to the reinforcement of the Eng. at night with eighteen fresh ships, and on the next day the Dutch were obliged to retire. They had eleven ships captured and seven or eight sunk in the action. The second battle was one of the hardest fought and most disastrous battles of the second Dutch war. The Eng. fleet, under the command of Monck, engaged the Dutch fleet, commanded by De Ruyter, in the Downs, on June 1, 1666. The fighting went against the Eng. who eventually had to retire with a loss of twenty-one vessels against the Dutch loss of seven ships only, although the victors were not in much better plight than the vanquished. An Eng. victory was gained in the third engagement, of July 25 and 26, 1666.

North German Confederation, league of Ger. states estab. in 1867, linking under Prussian leadership the twenty-two states N. of the R. Main. The king of Prussia was president and commander-in-chief of the army of the confederation. See also under GERMANY, *History*.

'**North German Gazette**', (formerly *Die Norddeutsche Allgemeine Zeitung*, later called *Die Deutsche Allgemeine Zeitung*), a daily paper estab. in Berlin in 1861, and known throughout Europe as a semi-official jour. As a medium of communiques against France, practically dictated to the editor by Bismarck, the *N. G. G.* not only focused the attention of Europe on its columns, but estab. itself as the authoritative organ of the Ger. Gov., a position which it only lost when the chancellor attacked the policy of Emperor William I. It remained the semi-official organ of the gov. until the revolution, and it was sold to Hugo Stinnes in 1920. It again became one of the mouthpieces of the gov. under the National-Socialist regime.

North German Lloyd, see NOUVEAU-SCHEM LLOYD.

North Ham, vil. of Canada in Wolfe co., Quebec. Pop. 1400.

North Holland, see HOLLAND, NORTH.

North Island, see NEW ZEALAND.

North Kazakhstan, region of the Kazakh S.S.R., lying on the N. border. The Ishim R. traverses the region of which Petropavlovsk is the chief tn. It is in the black earth steppe region and produces

grain, especially wheat, and beet. There are iron-ore deposits between the Ishim and upper Irtysh Rs.

North Lancashire Regiment, see LOYAL REGIMENT.

Northmen, see NORSE MEN.

North Land (*Leninland* or *Severnaya Zemlya*), Russian is. of the Arctic Ocean, N. of Cape Chelyuskin.

Northolt, vil. of Middlesex, England, 2½ m. S.S.W. of Harrow. There is an aerodrome used as a fighter station in the Second World War, and now an airport. Smaller than the London airport, and used mainly by smaller aircraft, it deals almost exclusively with home and European traffic. All the operators in W. Europe were using it in 1949 and its daily traffic average was about eighty aircraft movements, 1200 passengers, and twelve tons of freight. The airport is regarded as a temporary terminal for European traffic and plans have been drawn up to replace it in 1956 by an airport on the E. side of London. By then, it is estimated, 6000 passengers will pass daily through the continental terminal.

North Ossetian A.S.S.R., autonomous republic of the R.S.F.S.R., in the Caucasus. The Terek R. traverses the republic, the main tns. of which are Orjonikidze, the cap., Alagir, and Balta. Mt. Kazoek lies on the S. frontier with the Georgian S.S.R. Pop. 152,000.

North Park, one of the 'parks of Colorado,' U.S.A., in Larimer co., its area is 2000 sq. m., and it stands at a mean elevation of from 8000 to 9000 ft. It is noted for its big game.

North Plainfield, bor. of New Jersey, U.S.A., in Somerset co., 12 m. S.W. of Jersey city. Pop. 10,000.

North Pole, see ARCTIC EXPLORATION.

North-Rhine Westphalia, land of the Brit. occupation zone of Germany, consisting of the Regierungsbezirke Köln (Cologne), Aachen, and Düsseldorf of the former Rhine Prov.; the former prov. of Westphalia; and the former Land Lippe. The cap. is Düsseldorf. The area is 34,076 sq. km. and the pop. (1948) 12,640,000, of whom 32,000 were displaced persons living in camps. See further under RHINE PROVINCE; WESTPHALIA.

North Riding, see YORKSHIRE.

Northrop, John Howard (b. 1891), Amer. biochemist and biologist, b. at Yonkers, New York, and educated at Columbia Univ. (B.S. 1912; Ph.D., 1915; D.Sc. 1937). Since 1916 he has worked at the Rockefeller Institute for Medical Research, Princeton, New Jersey. N. is the author of a book on crystalline enzymes, and shared the Nobel prize in 1946 for his work in this sphere. He pub. *Crystalline Enzymes* in 1939.

North Sea, or **German Ocean**, European sea, bounded on the E. by the continent of Europe, on the W. by Great Britain; on the S. it is connected by the straits of Dover with the Eng. Channel and the Atlantic; and on the N. it extends to the Shetland Isles, joining the Norwegian Sea in the N.E. The N. S. is very shallow, the Continent and Britain once being coterminous. Its mean depth is about

fifty fathoms. The Dogger Bank stretches across the N. S. from E. to W. The coasts of the N. S. are mainly flat; the Eng. coast consists of sandy cliffs and beaches, and the continental coast consists of marshes and protecting banks. The N. S. waters are composed of a mixture of Baltic water through the Skagerrak-Atlantic water through the Shetland-Faroe channel, and Arctic water through the Norwegian Sea, and consequently there is a great variety of temp. and salinity in various parts of the sea. The union of the N. tidal wave and that from the straits of Dover sends high tides to London, a fact which is invaluable for shipping purposes. The Atlantic tides, which have a salinity of 35 *pro mille*, send out considerable heat. The fisheries of the N. S. are the most productive in the world. A Convention regulating the policing of the fisheries was concluded in 1882 by the European countries interested. Trawl fishing is extensively carried on in the shallow parts of the sea, and yields vast supplies of haddock, cod, whiting, halibut, sole, brill, turbot, plaice, etc. Line fishing is practised in the deep waters. The courses of the herring shoals round Britain are remarkable. In Shetland herring fishing commences in June, and later at various stages southward down the Brit. coast, till it ends in the late autumn and winter fishing off Norfolk. The maximum length is 600 m., and its greatest breadth is 400 m.; its area is 162,000 sq. m.

North Sea-Baltic Canal, see KAISER WILHELM CANAL.

North Shields, see SHIELDS, NORTH.

North Somerset, see SOMERSET.

North Staffordshire Regiment, see STAFFORDSHIRE REGIMENTS.

North Staffordshire University College, planned to open in 1950 to serve the heavily populated area around Stoke-on-Trent. A number of features distinguish the college from other Eng. univ. colleges. The chief force behind its inception was the activity of the city council of Stoke-on-Trent, the bor. council of Burton-on-Trent, and the co. council of Staffordshire, a corporate work paralleled only by the estab. of the 'Town's College' by the Edinburgh tn. council in 1563. Again, other univ. colleges have had to pass through a period during which external degrees only, of London Univ., could be taken, but the N. S. U. C. was empowered to organise from the outset its own examinations for a B.A. degree, although the univs. of Oxford, Manchester, and Birmingham sponsored the college and appointed representatives to an academic council responsible for the maintenance of academic standards. The normal B.A. degree course was fixed at four years, the first to be an obligatory study of general subjects; this is designed to prevent over-specialisation whilst still allowing the college to serve the technical and scientific needs of the area. Commencing with some 150 to 200 students, of both sexes, the maximum capacity of 800 was aimed at by 1953. Keele Hall, some 5 m. from Stoke-on-Trent, was acquired as a central

site; the capital expenditure for further building was made the responsibility of the Univ. Grants Committee in consideration of the fact that the three interested public authorities contribute some 25 per cent, instead of the usual 14 per cent, of the running costs. The first principal was Lord Lindsay of Birker.

Northstead, Manor of. Appointment to the crown stewardship of this Yorkshire manor serves as an excuse for the resignation of a member of Parliament. This is effected in accordance with the Place Act of 1742. See further under CHILTERN HUNDREDS.

North Sydney: 1. Residential suburb of Sydney, New S. Wales, Australia. It is situated on the N. shore of Port Jackson, and it possesses one of the largest suspension bridges in the world. Pop. 26,000. 2. Seaport of Canada, on Cape Breton Is., Nova Scotia, 8 m. N.W. of Sydney. It possesses 3000 ft. of quayage, and a depth alongside of from 15 to 28 ft. of water. Coal is mined. Pop. 8000.

North Tarrytown, vll. of Westchester co., New York, U.S.A., 26 m. N. of the city of New York, on the Hudson R. Near here is Sleepy Hollow of Washington Irving's *Legend of Sleepy Hollow*, and it is also the burial place of Irving. It possesses an old Dutch church, dating from 1699. It. manufs. automobiles. Pop. 8800.

North Tonawanda, city in Niagara co., New York, U.S.A., on the Niagara R., 10 m. N. of Buffalo. Its greatest amount of trade is carried on in lumber, but it also manufs. iron, nuts and bolts, boilers and engines, and merry-go-rounds, drawing its electric power from Niagara Falls. Pop. 20,200.

Northumberland, Dukes and Earls of. Since the time of the Norman Conquest there was an earl of N., but the title did not become hereditary until 1377, when Henry, Baron Percy, became earl. The title of duke of N. was held by John Dudley from 1551 until his death in 1553; he was a soldier and politician of Edward VI.'s reign, but was executed for plotting the exclusion of Mary Tudor and the accession of his daughter-in-law, Lady Jane Grey. The ducal title was held by George Fitzroy, a natural son of Charles II., from 1683 until his death without issue in 1716.

Except for a period of forfeiture, from the death in 1408 of the first earl until its restoration to his grandson, the title of earl remained in the Percy family (q.v.) until the death of the eleventh earl in 1670; his daughter married Charles Seymour, duke of Somerset, and their son Algernon, seventh duke of Somerset, became earl of N. in 1749. Dying without issue, his son-in-law Sir Hugh Smithson became earl and took the name of Percy: in 1766 he was created duke of N. The fourth duke d. in 1875, the title passing to his grand-nephew George, earl of Beverley: from him are descended the later dukes of N. See G. Brennan, *History of the House of Percy* (ed. W. A. Lindsay, 1902).

Northumberland, most northerly co. of England. The coast-line is flat and sandy, the cliffs are low, and there are few inlets. There are sev. ls., the most important being Holy ls., or Lindisfarne, and the Farne ls. The surface from the low plains in the E. rises to a moorland region in the centre, and so upward to the Cheviot Range, reaching its greatest elevation in Cheviot Peak (2676 ft.). The chief rvs. are the Tweed, Aln, Coquet, Wansbeck, Blyth, and Tyne; the Tweed being famous for its salmon fishing and the Coquet for its trout. In the S. lies the big coalfield; lead and zinc are found, and building-stone is quarried. The soil varies very much, and a large proportion is permanent pasture. Oats and barley are the prin. crops. Sheep rearing is carried on very extensively, there being a particular breed known as the Cheviots; cattle are also reared. The Tyne forms the great manufacturing centre, the



JOHN DUDLEY, FIRST DUKE OF
NORTHUMBERLAND

industries including shipbuilding, iron-works, blast furnaces, rope-works, chemicals, potteries, brickfields, and glass factories. Machinery and tools are also manufactured. N. Shields is the centre of the sea-fisheries, and Hexham has a large glove factory. The Tyne has the largest coal-shipping trade in the world, Newcastle being the prin. port. Other ports besides those on the Tyne are Blyth, Amble, Alnmouth, and Berwick. The co. is divided into three parl. divs., each returning one member. There are extensive Rom. remains in N. The co. originally formed part of the Saxon kingdom of Bernicia, which became merged into the kingdom of Northumbria (q.v.) about the end of the sixth century. It suffered considerably from the border raids, but there are some fine old buildings, notably Lindisfarne Priory (1093), Hexham Priory Church, built over the crypt of Wilfred's Abbey of St. Andrew, and the castles of Alnwick, Dilston, etc. The co. also includes such famous battlefields as Otterburn and Flodden Field, and is the

home of the great Percy family. Area 2018 sq. m. Pop. 730,400. See Victoria County History: *Northumberland*; Newcastle-upon-Tyne Public Library, *Local Catalogue of Material concerning Newcastle and Northumberland*, 1932; and Ann Sitwell, *Northumberland*, 1949.

Northumberland Fusiliers, Royal, raised privately in 1674 to assist the Dutch in their struggle with France, in 1685 became the 5th regiment of the line. It fought at the battle of the Boyne, served in the Seven Years' war and in the Amer. War of Independence, and fought in most of the great battles of the Peninsular war, winning the nickname of the 'Fighting Fifth.' In 1836 it became a fusilier regiment, and served in the Afghan war 1878-80, at Khartoum, and at the Modder R., and other battles in the S. African war (1899-1902). In the First World War the 1st Battalion was part of Shaw's 9th Infantry Brigade in the original B.E.F. In that war the N. F. comprised, besides three regular and special reserve battalions, five territorial force battalions, and a score of service (new army) battalions. The 1st Battalion was prominent at the capture of Givenchy (Oct. 1914) and in the storming of Aubers. Various units fought in the Somme battles of 1916, and, together with sev. Canadian units, the N. F. suffered very severe losses in the La Boisselle-Contalmaison region. The 9th Battalion greatly distinguished itself in the fighting near Mametz wood. In 1918 units of the regiment took part in the dour fighting on the Menin Road-Polygon Wood front of the Ypres salient. In the Second World War the N. F. served on the W. front and in N.W. Europe. They fought in the battle of Normandy, 1944, and in the advance to the Ithine, while other units were part of the Eighth Army (q.v.) and fought in the battles for Sicily, in those on the advance to Rome, and in the bitter struggle for the Gothic line.

Northumberland Strait separates Prince Edward Is. from Nova Scotia and New Brunswick. Length 130 m., breadth 8 to 30 m.

Northumbria, one of the greatest of the A.-S. kingdoms, situated between the Humber and the Forth, originally consisted of two independent kingdoms, Bernicia and Deira. Of the former kingdom Ida was the first ruler (547-59), and he was succeeded by his four sons, who ruled in succession. The first ruler of Deira was Ella (560-7605), and he was succeeded by Ethelfrith, who united the two kingdoms in 605. Edwin, son of Ella, defeated and slew Ethelfrith, and succeeded to the throne of N. He extended the frontiers to the coast (including Anglesey and Man), and during his reign the kingdom was the most powerful in England. After his death the kingdom disintegrated, and did not recover its former position till Oswy became king of Bernicia and annexed Deira. Oswy won a victory over Penda of Mercia and incorporated the N. part of Mercia in his kingdom. Mercia recovered her ter. in 658, and N. pushed her frontiers northward, annexing Strathclyde and Dalriada.

In 685 the Picts recovered their independence. Aldfrith, the son and successor of Oswy, made no further attempts to extend his kingdom. Under his patronage learning flourished. The successors of Oswy were incompetent rulers, and henceforth the decline of the kingdom is rapid. In 768 Alchred, king of N., sent an embassy to Charlemagne. The first Dan. raids occurred c. 783. In 827 Eanred, king of N., formally acknowledged the supremacy of Egbert I., king of Wessex. Egbert II. reigned till 878, and was the last Eng. king of N. Subsequently N. acknowledged the overlordship of Alfred the Great. N. was for a considerable period the chief seat in England of literary and missionary activity. In the Golden Age of the Conversion Cuthbert flourished in his monastery at Lindisfarne, Bede at Wearmouth and Jarrow, and Wilfrid at Hexham and Ripon. In 731 Bede at Jarrow wrote his famous *Ecclesiastical History*. The stone crosses, Ruthwell and Bewcastle as early examples, and the schools of York and Ripon as later developments, are evidence of the beauty and power of Northumbrian sculpture. It was not till the reign of William the Conqueror that N. really became an integral part of England. See R. H. Hodgkin, *History of the Anglo-Saxons*, 1939 ed., and T. D. Kendrick, *Anglo-Saxon Art*, 1938.

Northumbrian Dialect. see under ENGLISH LANGUAGE, Old English.

North Walsham, see WALSHAM. **NORTH. North-Western Province and Oudh,** see UNITED PROVINCES.

North-West Frontier, The, of the Indian sub-continent. It is one of the great frontiers of the Commonwealth, nearly 2000 m. in length, extending from the Karakoram Mts. in the N. of Kashmir to the Arabian Sea. In the far N. it is bordered by Sinkiang; thence, for a short stretch, it borders Russian Turkestan along the Pamirs, then turns S., and for the rest of its length lies through the mt. hinterland of the Afghan border tribes. From Chitral to Baluchistan, the boundary is the 'Durand line,' agreed with the Afghan Gov. in 1894. Throughout its length the frontier traverses Moslem ter., the greater part of which is occupied by fanatical tribesmen. Sinkiang, too, is predominantly Muslim. On the Kashmir side, in this region, are the small semi-independent Muslim states of Hunza and Gilgit. Before the independence of India the Brit. Gov. of India was responsible for defending the N.-W. F., and most of the Brit. Indian Army was concentrated on the frontier or in cantonments in the Punjab near by. But though in 1949 the Pakistan Gov. had fewer forces at its disposal the position, in one respect, was more favourable for Pakistan than it was for the Brit. authorities, because as a great Muslim power it was likely to continue to attract a degree of loyalty from the tribesmen never given to Britain. Pakistan therefore withdrew most of its regular forces from the frontier, relying on the Frontier Irregular Corps and a few aeroplanes to keep the peace. There were,

however, signs that this state of equilibrium might not continue, an uncertain factor being the attitude of the Afghan Gov. towards the Durand line settlement, which they had always regarded as one which deprived them of the allegiance of the tribes on the Indian side of the line. In 1947, after the decision to partition India, an effort was made to satisfy Afghan sentiment by holding a plebiscite in the N.-W. F. Prov. on the issue whether the Afghans there wished to join India or Pakistan. The plebiscite resulted in Pakistan's favour, a result which was resented by the Afghan Gov., which had intimated to Britain that it did not regard the prov. as a part of Brit. India. Despite propaganda from Kabul that Afghanistan was no longer interested in the idea of the independence of the N.-W. F., it was obvious that official circles in Kabul still entertained hopes of Afghanistan *irredenta* and backed their hopes by moving two divs. of troops to the frontier adjacent to the Khyber Pass. See also KHYBER PASS. See Sir W. R. Barton, 'The North-West Frontier,' in the *Fortnightly*, Aug. 1949.

North-West Frontier Province, founded in 1901, forms the most northerly div. of Pakistan, lying between lat. 31° 4' and 36° 7' N., and long. 69° 16' and 74° 7' E. It is composed of the former Punjab dists. of Bannu, Kohat, Peshawar, Dera Ismail Khan, the Hazara dist., and the mountainous region near the border of Afghanistan inhabited by independent tribes.

Between the settled dists. of the N.-W. F. P. and the Afghan frontier lies tribal ter. This is divided into five political agencies: Malakand (Swat, Chitral, and Dir), Khyber, Kurram, N. and S. Waziristan. There are further areas under the political control of the deputy commissioners of the six dists. of the N.-W. F. P., and known as tribal areas. In the agencies and tribal areas are five states: three in the Malakand Agency (Swat, Chitral, and Dir States) and two (Aint and Phuleria States) in the tribal areas adjoining Hazara dist. This tribal ter. has an area of 24,986 sq. m. with a pop. of 2,500,000.

The prin. crops are maize and bajra in the cold weather, and wheat, barley, and grain of various kinds in the spring; rice and sugar canes are grown in Hazara, Peshawar, and Bannu, and cotton and tobacco in Peshawar. The climate presents a great variety of conditions; there are two seasons of rainfall, the monsoon and the winter rains, both somewhat uncertain. The prin. industry is agriculture. The prov. is irrigated (area irrigated is about 389,000 ac.) by various canals owned either by private individuals, dist. boards, or the gov.; railways run from Rawalpindi to Peshawar and Jamrud, to Kusalgard and on to Thel, and from Nowshera to Dargai. A railway through the Khyber (27 m. long with thirty-four tunnels) from Jamrud to the Afghan frontier, was opened in 1925. There is a hydro-electric power station at Malakand. The chief tms. are Peshawar (173,400) and Dera Ismail Khan. The prevailing language is Pashto (an Indian

tongue mixed with Punjab words) and most of the inhab. are Pathans. The area of the whole prov. is 39,370 sq. m., of which 14,290 sq. m. represent the settled dists., as opposed to the agencies and tribal areas, the former being the prov. proper, under a governor. There is a single-chamber Legislative Assembly of fifty members, and a council of ministers to advise the governor. Pop. 3,038,000, about 91 per cent being Muslims.

The frontier ter. was annexed in 1849 and put under a board of administration at Lahore. In 1901 the frontier dists. were separated from the Punjab under the name of the N.-W. F.P. See Sir J. Douie, *The Punjab, North-West Frontier Province and Kashmir*, 1916; C. M. Enriquez, *The Pathan Borderland* (Calcutta), 1921; C. C. Davies, *The Problem of the North-West Frontier*, 1932; Sir W. Barton, *India's North-West Frontier*, 1939; and R. North, *The Literature on the North-West Frontier*, 1947.

North-West Highway System, the Canadian section (1257 m.) of the Alaska Highway. See ALASKA, *The Alaska Highway*.

North-West Mounted Police, famous force of paid and uniformed military police organised by the Canadian Gov. in 1873 under civil law and popularly known as the 'Mounties.' Though the Red R. Rebellion had ended in 1871, there was no security in the thinly pop. W. for life or property after Gen. Wolseley's soldiers had been withdrawn. The problem was met first by sending a garrison to replace Wolseley's soldiers and then by raising the N.-W. M. P. In the summer of 1874 their scarlet coats (scarlet was chosen for the tunics because it was admired by the Indians on the Canadian side of the border) appeared on the prairies for the first time, when a detachment of 300 men marched from Dufferin, now the border tn. of Emerson, to posts on the plains. This land march, ending where Fort McLeod was built, is one of the most memorable episodes in the hist. of the N. W. M. P. The mounted police were never a large force and always depended on their reputation for integrity, fairness, and courage rather than on numbers. They soon dealt with law-breakers, whisky runners vanished, and Fort McLeod became a centre for the maintenance of law and order on the border lands of the W. The police also had an important part in the difficult problem of the half-starving Indians of the prairies and much of the work of persuading them to go on the Reserves was entrusted to the mounted police. Their forts had been centres for the distribution of food, and from those centres the tribes were shepherded northward to the wooded country where lands had been set apart for them, and the 'mounties' were always regarded by the Indians as friends. In 1920 the police were given duties in various parts of the Dominion and the name was changed to the Royal Canadian Mounted Police.

North-West Passage, see under ARCTIC EXPLORATION.

Northwest Territories. The mainland portion of Canada, N. of lat. 60°, between Yukon Ter. on the W. and Hudson Bay on the E., together with the is. between the Canadian mainland and the N. Pole, including those in James Bay, Hudson Bay, and Hudson Strait, comprises the N. Ters.; the region includes the former N. Ter. and Rupert's Land except such areas of these as form the Yukon Ter. and the provs. of Alberta, Manitoba, and Saskatchewan. There are three administrative dists., Mackenzie (527,490 sq. m.), Keewatin (228,160 sq. m.), and Franklin (534,032 sq. m.).

Along the shores of the Arctic Ocean and stretching far inland lies a country covered with a sort of Arctic grass, which has considerable nutritive value. S. of this region are the forest lands, chiefly black spruce, white spruce, and larch. In the W. part of the ter. is the great water system of the Mackenzie, which includes the Athabasca and Slave Rs., with Great Bear and Great Slave Lakes. Great Bear Lake is fourth in size of the lakes of N. America. The Mackenzie R. and its lakes extend 1460 m. N. and S.; with the addition of its trib., the Athabasca, its length is 2525 m. The large alluvial plains of its basin grow vegetables and wheat, oats, and barley; while trees a foot in diameter grow in its delta, within the Arctic Circle.

The fur trade and mining are the chief industries. Furs to the value of \$1,743,710 were obtained in 1944-5; the most valuable is white fox, and others include beaver, mink, lynx, and red fox. Gold and silver and other minerals are mined on the N. shore of Great Slave Lake in the Yellowknife Region. Uranium concentrates and radium are produced from pitchblende ore at the Eldorado mine on Great Bear Lake. A large oilfield was found in 1943-44 in the Lower Mackenzie Basin, petroleum being produced at Norman Wells. Natural gas is found. Mineral products (excluding pitchblende products) were valued at \$1,039,525 in 1946. There is a fishery on Great Slave Lake, and caribou herding as a native industry is being developed. To aid the development of the N. Ters. a highway of 315 m. is projected from Hay R. to Notikewan in Alberta, and a 8000 h.p. hydro-electric plant on the Snare R. 94 m. N.W. of Yellowknife.

The area is 1,304,903 sq. m. The 1941 pop. was 12,000 (including approximately 2300 whites, 4300 Indians, and 5400 Eskimos); largely owing to increased mining activity the 1948 pop. had risen to an estimated 16,000. See R. Flinie, *Canada Moves North*, 1942, 1947; C. C. Lingard, *Territorial Government in Canada: the Autonomy Question in the Old Northwest Territories*, 1946; N. Polunin, *Arctic Unfolding*, 1948; and the pubs. of the Bureau of N. Ters. and Yukon Affairs, Dept. of Mines and Resources, Ottawa.

Northwich, tn. of Cheshire, England, on the R. Weaver, 18 m. E.N.E. of Chester. Among the few ant. relics in the tn. is the picturesque church of St. Helen, which belongs to the sixteenth century. The

chief industry is the manuf. of chemicals, the works being among the most extensive in the world. There are also shipyards, steel-works, and iron foundries. The tn. was once subject to numerous land subsidence caused by the pumping of the brine used for the manuf. of salt and alkali, but since the introduction of controlled pumping in recent years the subsidence has been negligible. Pop. 19,000.

Norton, Caroline Elizabeth Sarah (1808-1877) later Lady Stirling-Maxwell, Eng. poet and novelist, b. in London, was the granddaughter of Richard Brinsley Sheridan, the dramatist. The unhappiness of her married life led her to interest herself in the amelioration of the laws regarding the social condition and the separate property of women and the wrongs of children. Her poems *A Voice from the Factories* (1836) and *The Child of the Islands* (1845) had as an object the furtherance of her views on these subjects. Her efforts were largely successful in bringing about the needed legislation. Her chief works are *The Sorrows of Rosalie* (1829); *The Undying One* (1830); *The Dream* (1840); *The Child of the Islands* (1845); *The Lady of La Garaye* (1861); and the novels *Stuart of Dunleath* (1851) and *Lost and Saved* (1863). See J. G. Perkins, *The Life of Mrs. Norton*, 1909; and Alice Acland, *Caroline Norton*, 1948.

Norton, Charles Eliot (1827-1908), Amer. man of letters, b. at Cambridge, Massachusetts, U.S.A. He occupied the chair of hist. of fine art in Harvard Univ. from 1873 to 1898. He was joint editor of the *North American Review* with James Russell Lowell (1861-68), and a founder and co-editor of the *Nation* (1865). His chief works are *Considerations of Some Recent Social Theories* (1853), an attack on experimental Socialism; *Notes of Travel and Study in Italy* (1860); and *Historical Studies of Church Building in the Middle Ages* (1876). But he will be chiefly remembered for his trans. and studies of Dante's *Vita Nuova* and *Divina Commedia*, and his *History of Ancient Art*, 1891. He also ed. Carlyle's *Reminiscences* (1887), making good the blunders made by Froude in 1881, and *The Poems of John Donne* (1893). N.'s *Letters* were pub. in two vols. in 1913. See life, ed. by S. Norton and M. A. de Wolfe Howe, 1913.

Norton, Thomas (1532-84), Eng. dramatist and lawyer, b. in London. He entered Parliament in 1558, and was appointed to the office of Remembrancer of the City of London in 1571. He collaborated with Sackville in the composition of the first Eng. tragedy, *The Tragedie of Gorboduc* (1561), written in blank verse.

Norton: 1. Par. and vil. of Derbyshire, England, 8 m. N.W. of Chesterfield. Pop. 2000. 2. Par. and vil. of Durham, 1½ m. N. of Stockton-on-Tees. Pop. 330. 3. Par. and tn. of E. Riding, Yorkshire, on the Derwent, 17½ m. N.E. of York. It is noted for the training of racehorses. Pop. 5000.

Norton Sound, inlet of the Bering Sea, Alaska, lying S. of Seward Peninsula. Norton Bay and Godolphin Bay are on

the N. shore. Length 150 m; width 100 m.

Norumbega, name of unknown origin, found especially in sixteenth- and seventeenth-century maps to indicate a region or city on the E. coast of N. America. It is probably mythical but has been identified with Vineland, the Norse settlement supposed to have been discovered by Ericsson or by Karlsefni, the name of which is derived from the legend that grapes were found there.

Norwalk: 1. Health resort of Connecticut, U.S.A., in Fairfield co., at the mouth of the R. N., on Long Is. Sound, 12 m. W.S.W. of Bridgeport. The harbour is excellent. The oyster fisheries are extensive: other industries include shipyards, iron works, and foundries. Pop. 36,000. 2. Co. seat of Huron co., Ohio, 31 m. W.S.W. of Cleveland. Pop. 8000.

Norway (Norwegian *Norge*), Scandinavian kingdom occupying the W. and N. part of the Scandinavian peninsula. It is surrounded on three sides by the sea, on the S. by the Skagerrak, on the W. by the North Sea and Atlantic Ocean and on the N. by the Barents Sea. It is therefore cut off from Europe except for the land connection through Russia and Finland. It extends from the is. Krage in the S.W. (lat. 57° 57' N.) to Knivskjelodden on Mageroy, W. of the N. Cape (lat. 71° 11' N.) in the N. E.; and its most westerly point is Husøy in the Sognefjord (long. 4° 30' E.) and the most easterly Kiberg near Vardo (long. 31° 10' E.). The length of the coast, disregarding indentations, is 2100 m.; including the coastline of long inlets and of large is. it is at least 16,400 m. or more than half the circumference of the earth. Area 124,500 sq. m. (8900 being is. or skerries). By the treaty of 1920 Norway was given sovereignty over Svalbard (Spitsbergen) and Bjornoya (Bear Is.) and, including these, the total area is 155,000 sq. m. In the Middle Ages the kingdom of Norway was twice as large as it is to-day but much was ceded to Denmark; and at different periods Norway had various trib. lands, such as parts of Ireland, Scotland, the Hebrides, Lapp districts, Greenland, Iceland, and others. The Norwegian-Swedish frontier is 1025 m. long and the Norwegian-Finnish 572 m.; the total land frontier being nearly 1600 m. Norway consists of a high plateau, intersected in the S.E. by great valleys and in the W. by deep fjords and bays. More than half its surface is over 2000 ft. high. The interior is generally so mountainous that the pop. is settled almost entirely along the coast. Only in the great valleys of S. Norway and in the Trondhjem Depression is there a high density of pop. inland. Pop. at the end of 1946 was estimated to be 3,123,000, giving a density of about 25 per sq. m. With the exception of some 20,000 Lapps and Finns, living in the most remote N. regions, the inhab. of Norway are generally a Scandinavian race, akin to the N. Germanic nations of Aryan descent.

Physical Features.—Certain fundamental physical features characterise the topo-

graphy of Norway, and variations in their form and type heighten the variety of the landscape. The prin. features are the skjærgård and the strand flat; the fjords; the gorges; the plateaus, with summits rising above their surfaces; ice-sheets; and valleys, often deeply incised. The skjærgård is the is. zone of striated rock with but little vegetation. The outer is. are low-lying, but towards the mainland they are higher. The strand flat is a series of rock terraces along the borders of many of the is. and in the mouths of some of the fjords. The fjords have all the characteristics of glaciated valleys, being long, narrow, and straight, with uneven floors. The gorges extend inland above the level of the fjords and torrents flow down from the high uplands in great falls, roaring through the gorges. The plateaus are the upland surface above the gorges and rise steeply from the W. coast towards the main watershed of Norway, and they are more extensive in S. than in N. Norway.

(a) *Southern Norway*.—The great barren plateau known as the feld occupies the W. part of much of S. Norway. It is diversified by fjords, gorges, and valleys, and its main sub-divs. are the viddas Jostedalsbreen¹ and Isterøsvidda, collectively known as the Langfjeld, and the Dovrefjeld, Trollheim, and Rorosvidda, collectively the Dovrefjeld. The viddas stretch for miles of barren, wind-swept rock varied with wild moorland and bog and numerous lakes and rivs., which enhance the general desolation. Jostedalsbreen region, lying N. of the Sognefjord, is an immense ice-cap extending over 580 sq. m. The Jotunheim is the wild, mountainous region lying below the Jostedalsbreen and the Boverald on the W., and the Gudbrandsdal on the E. It is a region of towering snow-covered peaks, the highest being Galdhöpiggen (8097 ft.), the highest mt. in Norway, Glittertind (8041 ft.), and Skagastolstind (7887 ft.). The Dovrefjeld is a sea of barren rocky summits with patches of moorland and peaks rising above the general level of the plateau. The highest peaks are Rondeslottet (7162 ft.), subetta (7500 ft.), and Storronden (7027 ft.). There are sev. deep forested valleys cutting across the feld and providing through routes from Oslo. The Trollheim, which extends northward to the Trondhein depression, is barren and rocky in its highest part, but towards the coast the plateau decreases steeply in height and contains large forested areas. The S.E. lowlands consist of the valleys of the great rivs., flowing S. to the Skagerrak and S.E. to the Oslofjord, together with the plains lying round their mouths along the coast. It is a pleasant undulating countryside and the rivs., with their waterfalls, are conducive to agriculture and industrial development. The largest of the valleys of this region, the Setesdal, is followed by the R. Otra for 150 m. to its outlet in the Kristiansandsfjord. Other rivs. of this region are the Topdalselv and the Nidely. Between the viddas and the lowland to the E.

is the Telemark, a region of many lakes and riv. valleys, with bare outcrops and patches of conifers. It is broken by three main riv. systems. The rivs. feed the Totakvand, characterised by a remarkable series of locks, and the Tinnsjø, which flows in a deep forested valley to the great Hukkan falls. Below Lake Tinnsjø it descends by a series of great falls to the Hitterdalsvand. All these rivs. flow into the Norsjø and drain into the Langesundsfjord by the Skiens R. E. of the Telemark many rivs. flow S.E. towards the Oslofjord. The Laugen, flowing through Nandal, reaches the sea in Larviksfjord. Another similarly named riv. rises in a lake in the heart of the Dovrefjeld, flows into Lake Mjøsa, below which it is called the Vorma as far as its confluence with the Glomma. Lake Mjøsa, the largest lake in N., lies in an open wooded valley with gently sloping hills on each side. The Glomma, which follows the Osterdal, has a course of 400 m. from its source in the Rørosvidda to its mouth on the E. of Oslofjord. The current of the Glomma is swift and the riv. is used, especially in spring floods, for floating timber. The Dramselv, draining the Tyrifjord (a lake), descends in a broad valley to Hokksund where it veers E. and flows through a wide cultivated valley to Drammen at the head of the Dramsfjord, the northerly part of the Oslofjord. Oslo itself lies in a small depression at the head of the fjord; low hills covered with spruce and pine extend westwards from the city and northward the hills rise higher to the forest of Nordmarken. The Begna, rising in the S. of Jotunheim, flows through the Valdres valley in a number of lakes and a gorge below the Strandefjord, joining with the Randselv, and thence descends through a broad valley by a series of rapids.

(b) *Northern Norway*.—The main topographical divs. of N. Norway are the Trondhein Depression, and Trondelag, Nordland, Troms. the coastal is. between Altafjord and Majeroy, and the plateau region of Finnmark. Towards the S. of the Trondhein Depression are the E. Highlands (highest point, Storsola, 5600 ft.). The dominant feature of the lowlands of the Trondhein Depression are the Trondheinfjord, the Suasavatn lake (30 m. long) and Nandal. The country surrounding the fjord and lake is undulating and includes the rich region of good farms and large coniferous forests. The R. Namsen, flowing along the Nandal into the Namsenfjord, is the prin. riv. of the Trondelag. The Nordland includes all Helgeland as far N. as Ofotfjord. Sev. snow-fields rise in isolated peaks above the level field, the largest being Sulitjelma (6300 ft.) and Blåmannsosen (4800 ft.). In the Troms region the E. highlands occupy the coastal part of the mainland. The coast N. and S.E. of the Malangenfjord in this region is cut up into narrow peninsulas which have a wild and grand aspect with mts. beetling above the steep slopes of the rugged coast. Finnmark plateau is a vast stretch of barren

country extending from the W. watershed of the Altafjord across the N. part of Norway to the Finnish frontier. The coast is formed by low cliffs unscreened by is., and exposed to the Arctic. The chief fjords are the Altafjord, Porsangerfjord, Laksefjord, Tanafjord, and Varangerfjord. All cut deeply southwards into the plateau, except the Varangerfjord, which runs W. The plateau is dissected by numerous rvs., of which the Alta, Tana, Neiden, Munkelv, and Pasvik are the chief. The Tana and the Anarjokka, its confluent, form the frontier with Finland for 150 m., the Pasvik for 60 m. The Munkev, which rises in Finland, has only a few m. of its course in Norway.

(c) *The Coasts.*—The remarkable development of fjords results in a coastline of amazing complexity. The rugged shores often rise in sheer walls of rock from the water's edge, which restricts navigation to a few well-defined routes. A screen of reefs fringes the mainland between Cape Lindeanes (the most southerly point of the Norwegian mainland) and the Skjens R. Cape Lindeanes is a craggy headland at the end of a rocky forested peninsula. There are no large fjords extending far inland in this part of the coast such as are to be found on the W. coast, but there are many inlets, of which Kristiansandsfjord and Topdalsfjord together form the largest. The Oslofjord extends N. from the Skagerrak for 60 m. from 59° N. lat. Its shores are not very steep and the outer part is undulating forested land. It is a region of numerous scattered farming communities, with some large industrial tns. (Drammen, Tønsberg, Oslo, Halden, etc.). From Cape Lindeanes northwestward are the Rostfjord and Grønsfjord with steep rugged shores, the Lyngdalafjord and Listerfjord each side of the Lister Peninsula, characterised by a steep coast as far as Arnasira, craggy and treeless N.W. of that place. The coast of Jæren is unlike any other part of the Norwegian coast, there being no is. or fjords, though on the Stavanger Peninsula there are some is. and large inlets. The Haugesund Peninsula is divided into distinct regions by sev. narrow fjords which are generally frozen in winter. The Hardangerfjord penetrates the mainland for 70 m. in a N.E. direction, while the main branch, the Sørfjord, runs S.W. for 24 m. There are extensive farmlands along both shores of the Sørfjord. Between the Hardangerfjord and the Sognefjord (about 80 m. N. of the Hardangerfjord) the coast is characterised by channels and lesser fjords, which form numerous is. and peninsulas and a most irregular coastline. Bergen is the nodal point of this region and lies sheltered at the foot of steep hills. The Sognefjord extends eastward into the mainland for about 100 m. and is for the most part narrow. The field on each side increases from 2000 ft. to 5000 ft. at the landward end and many streams flow into the fjord. Cultivable land here is rare. The coast of Salten from the Lofoten Is. is pierced by large fjords, which almost touch the Swedish frontier. The whole coast here

is a labyrinth of complicated channels running between is. and promontories.

Climate.—There are striking differences in the Norwegian climate, which changes markedly from the coast inland, or from W. to E. Apart from general influences such as the ocean, altitude, and lat. the weather of Norway is controlled by depressions along its shores. Most pass along its W. shore and bring S. and S.W. winds on the coasts. Less often they pass along the S. coast and into the Baltic, while some cross the peninsula in the region of Trondhjem. In winter the lowest temps. are experienced in Finnmark and around Røros, i.e. in the country furthest from the sea or from the influence of the Gulf Stream. At the latter place, for the first three months of the year, the temp. rarely rises above freezing point. Some of the coastal waters have quite mild winters. The highest temps. are to be found in the valleys immediately N. of Oslo, the July mean being 63° and the absolute maximum as much sometimes as 95°. Frost is frequent in all but the outer coastal areas. There are great contrasts of rainfall due to distances from the sea and altitude. The coastal int. region has a high rainfall. In the regions near the N. Cape storms are almost incessant, and rage with great violence. In the W. there are areas with falls up to 120 in., but at no great distance from the coast falls of 10-12 in. are common. Winter temps. decrease northwards, and N. of Trondhjem the monthly mean is below freezing-point until spring, and on the mild W. coast snow falls on about forty days in the year, but inland there is naturally a higher snowfall. Sev. of the mts. rise above the limit of permanent snow. Fog is frequent on the S. coasts. In winter it is less widespread in the interior and is concentrated mainly in the E. valleys. The longest day, which in the S. is 18 hrs., may be said to be nearly three months in the high lats. of the N. dists. where the longest night lasts almost an equal length of time. The protracted winter of the N. regions follows almost suddenly on the disappearance of the sun, whence the absence of solar light is compensated for by the frequent appearance of the aurora borealis, which shines with sufficient intensity to allow of the prosecution of ordinary occupations (see also MIDNIGHT SUN).

Flora and Fauna.—Norway has a luxuriant vegetation, despite its N. situation. It lies mainly within the area of coniferous forests, which are characteristic of cool temperate regions. Vegetation in the N. and on the field of W.-central Norway consists chiefly of shrubs, arctic plants, and mosses. The richest vegetation is round the Oslofjord and the great lakes Mjøsa, Randsfjord, and Tyrifjord. Scotch pine and Norway spruce are the most important conifers. In the coniferous zone very little other vegetation can survive, but in the bogs and marshes are sphagnum, ling, bilberry, and cloudberry. Willow and lichen grow in the feld region of the S.W. There are no trees in the

willow zone. Dwarf birch and willow shrub, however, form a dense growth of bushes. Reindeer moss predominates in the lichen belt. Herbaceous arctic plants also grow in the willow and lichen belts. The white *Ranunculus glacialis*, a food for reindeer, occurs on high mts. The fjords of W. Norway are barren and their sides afford little soil for vegetation. In the Trondheim Depression spruce is the predominant tree. N. of that region birch is the important forest tree. With the exception of the forest trees there are few plants of economic value in Norway, but seaweeds have some value for their salts of iodine. Peat bogs are extensive. The most characteristic of the arctic animals of Norway are the reindeer, arctic hare, arctic fox, lemming, and wolverene. These are found throughout most of N. Norway. The reindeer are largely tame and are herded by Lapps, but there are wild reindeer in Finnmark and in the mts. of central and S. Norway. Lemmings migrate in great numbers towards lower land pursued and destroyed in equally large numbers by wolves, foxes, and hawks. The wolverine or glutton is valuable for its fur. The elk, red deer, roe deer, and reindeer are the only wild ruminants. The elk (q.v.) is found in most of the forest regions of E. Norway. The bear, lynx, wolf, fox, otter, and various species of marten were, until recently, widespread and numerous, but the larger beasts of prey are now rare. The bear is almost exterminated and only found immediately N. of Trondheim. The badger occurs in S.E. and S. Norway. The beaver has almost died out. The white whale appears off the N. shores. Bearded seal and walrus sometimes visit the far N. Reptiles include the lizard, slow-worm, and common viper. Most Norwegian birds are migratory. Those which breed in Norway are geese, wader, crane, curlew, snipe, sparrow, and falcons. The mild climate of the S. and W. causes birds such as the starling, blackbird, woodcock, duck, and swan to winter there. Along the W. and N. coasts there are numerous colonies of sea-birds, including gulls, terns, guillemots, razorbills, puffin, kittiwake, cormorant, and eider ducks. Other coastal birds are sheldrake, heron, lapwing, oyster-catcher, and sea-eagle. Lowland birds are thrush, kestrel, skylark, jackdaw, wren, and corn-crake. The most important game-bird in the lowlands is the partridge. On the higher land are black grouse, willow grouse, blackcock, capercailzie and ptarmigan. Black duck, golden plover, and ruff are found by marshes and lakes. Other common birds are the swallow, bullfinch, golden eagle, crow, blue-tit, and magpie. Fish occur in most of the rivers and lakes. The commonest in the W. and N. coast rivers are char, salmon, and trout. Grayling, perch, pike, turbot, and other fish of E. and central European origin occur in the waters of E. Norway. The sea-fish include finbacks (rorqual), dolphin, porpoise, cod, pollack, haddock, whiting, ling, herring, and sprat. Mackerel and tunny are the only S. visitors which dis-

appear in the winter. The Greenland shark comes into the fjords and coastal waters.

Production and Industry.—The occupations of the Norwegian people are to a very large extent determined by the natural conditions of the country. Agriculture plays so important a part that Norway was almost entirely an agric. country until the beginning of the twentieth century, when hydro-electricity was first used for large-scale industry. Since then, with abundant cheap power, many manufacturing industries have grown up, notably the electro-chemical and electro-metallurgical, although most raw materials have to be imported. At



Royal Norwegian Emoassy

HARDANGERFJORD, WESTERN NORWAY

the end of 1947 the total production of electricity amounted to 11,598,000,000 kWh., of which 11,500,000,000 kWh. were produced by hydro-electric plants, 18 per cent of the available water-power being developed for electricity production. About 80 per cent of the pop. have electricity in their homes. About 800,000 are occupied in agriculture and forestry; 200,000 in fishing and hunting; 800,000 in industry and handicrafts; and 600,000 in commerce and transport. Norway, as has been seen above, is barren and mountainous for the most part and the acreage under cereals is not great: in 1947 the acreage was: wheat, 72,000 ac.; barley 96,600 ac., oats 187,100 ac., rye 3,100 ac., and hay 1,475,700. The forests are one of the chief natural sources of wealth. There are 29,000 sq. m. of forest land, largely under pine, and state forests cover 5,200 sq. m. The essential part of the growth is used in the paper industry. Pyrites and iron ore are the chief minerals; but silver, copper, nickel, zinc, lead, and molybdenum are among other ores and minerals found,

while among metals and alloys are aluminium, nickel, copper, ferro-alloys, etc. The richest mines are situated in the S., and chiefly in the dist. of the Glommen, as the celebrated and anct. silver-works of Kongsberg, the copper-mines of Røraas and Kaafjord, and the numerous iron shafts on the S. declivities of the mts. between Kongsberg and Glommen. The output of the sea-fisheries is large, totalling over 750,000 tons in 1945, more than 550,000 being herring and 119,000 cod. Whale-oil production averaged over 1,000,000 barrels between 1933 and 1937, but fell to 730,000 barrels in 1939; in 1947 it was 980,000. Industry is chiefly based on the primary products of the country (wood and fish) and on water-power. The pulp and paper industry, the canning industry and the electro-chemical and electro-metallurgical industries are the most important industries from the export standpoint. Trade in 1948 was valued at 3,600,000,000 kroner for imports and 2,000,000,000 kroner for exports. Imports from Norway to the United Kingdom in 1948 were £18,418,000 and exports to Norway from the United Kingdom £32,560,600. The registered Norwegian mercantile marine (as at Nov. 1, 1949) was (ships over 100 gross tons only) 2089 vessels totalling 4,981,200 gross tons. Ships on order or under construction totalled 1,813,800 gross tons. The total tonnage of the mercantile marine is expected to reach 6,000,000 gross tons in 1951. After the Ger. invasion of 1940 many Norwegian vessels crossed over to Brit. ports. There are 2373 m. of state railways and about 100 m. privately owned. Of this mileage 1897 m. have a gauge of 4 ft. 8½ in. and 533 m. a gauge of 3 ft. 6 in. Aviation is controlled by 'Scandinavian Airlines System,' a merger of Det Norske Luftfartselskap, Dan. Airlines, and Swedish Airlines being carried out in 1946. All services are co-ordinated, though the three companies still exist as independent units. There was a fleet of seventy planes in 1948; 92,603 m. were covered in summer 1948.

Total revenue and expenditure in 1947-48 were respectively 2,184,458,000 and 2,308,717,000 kroner.

The chief tns. are Oslo (formerly Kristiania), 418,000; Bergen, 108,900; Trondhjem, 56,400; Stavanger, 49,200; Drammen, 26,600; Kristiansand, 24,100; Haugesund, 18,600; Aalesund, 18,000; Moss, 17,000; Skien, 14,700; Fredrikstad, 14,100; Kristiansund, 12,900; Sarpsborg, 12,800; Tønsberg, 11,400; Arendal, 11,300; Tromsø, 10,800; Horten, 10,800; Narvik, 10,200; Hamar, 10,200.

Constitution and Government.—The Constitution of Norway is dated May 17, 1814, and has been modified since that date. It vests the legislative power in the Storting (Parliament), the representative of the sovereign people. The royal veto in regard to Acts may be exercised twice, but a Bill which passes three separate Stortings becomes law without royal assent. Every Norwegian subject of 23 years of age, subject to residential qualification, is entitled to vote.

Since 1938 the electors choose their 150 representatives every fourth year. Representatives must be voters in the dist. from which they are chosen, but this does not apply to ex-Cabinet ministers. By a law of 1938 all branches of the gov. services, including the State Church, are open to women. The Storting, when assembled, divides itself by election into two sections, the Lagting and Odelsting, one-quarter and three-quarters of the members respectively. Questions relating to the laws must be considered by each section separately. All new laws must first be laid before the Odelsting, from which they pass into the Lagting for acceptance or rejection. If the two sections do not agree, they assemble in common session and the final decision goes by a majority of two-thirds. The same majority is required for alterations in the Constitution. The executive is represented by the king, who exercises his authority through a council of state (Statsraad). The ministers are entitled to be present in the Storting and to take part in the debates but may not vote.

Religion and Education.—The evangelical Lutheran religion is the national Church and the only one endowed by the State. Its clergy are nominated by the king. All religions are tolerated, but Jesuits are, conformably to the constitution, excluded from the country. There are about 91,000 dissenters.

Education is compulsory from the age of seven to fourteen years. In 1944-45 there were 445 rural school dists. with 236,230 pupils and in the tns. 55,830 pupils. Most of the 280 secondary schools are mixed. Norway has two univs., at Oslo (founded in 1811) and at Bergen (opened in 1948). There is a univ. college of science and technology in Trondheim, a univ. college of commerce in Bergen, and a univ. college of agriculture near Oslo. There are sev. high schools, special schools, technical, art, industrial, and craft schools, a veterinary college, and a teachers' training college.

Defence.—The army of Norway is a national militia. Service is compulsory and universal, liability commencing at eighteen and continuing till fifty-five. The strength, training, and organisation of the army is (1949) under consideration. The Ger. invasion of 1940 greatly upset Norwegian mobilisation, for it embraced all the chief ports simultaneously and these were the main mobilisation centres. The only div. that was able to mobilise almost complete was in the far N. The navy has eight destroyers, five torpedo-boats, three corvettes, five submarines, eleven minesweepers, nineteen motor torpedo-boats, three motor launches, and three fishery protection vessels. Some ex-Ger. minesweepers are being rotted. Personnel includes 4046 men, and 897 men in coastal artillery. The air defence, divided into four commands, is largely equipped with Brit. aircraft.

History.—There is good evidence of the presence of sub-Palaeolithic man in N. Norway, and modern research has been directed to the prov. of Finnmark where

traces of the earliest settlers in Scandinavia have been found on the banks of the fjords.

The vikings play a part in the obscure and somewhat fabulous early hist. of Norway, which is comprised in that of other Scandinavian countries. The viking period, however, ended early in the tenth century with more settled conditions in Norway, and its conversion to Christianity. The sea-rovers were, moreover, never more than a fraction of the people, most of whom were peaceable farmers and fishermen. Harald Haarfagre (Harald the 'fair-headed') was the first to bring all the settled parts of Norway under one rule. He was descended from the kings of Vestfold, a dist. W. of the Oslofjord, and was son of Halfdan the Black who ruled further N. He began to reign some time after 864, and from his time the hist. of Norway is comparatively full and authentic. When his own inherited kingdoms were secure, Harald, fired by Charlemagne's example, marched into and subdued the Trondheimers. But it was only after sev. more years that he routed the chiefs of the W. coast in a great battle at Hafsfjord near Stavanger. His defeated enemies had to take an oath of fealty to him and the *fylke*-kings (the *fylker* were the old tribal divs.) were replaced by *jarls*, removable at his pleasure. Harald d. c. 933 and left his kingdom to be divided among his many sons, making Erik, his favourite son, a sort of suzerain. Erik at once tried to secure all for himself and to that end murdered two of his half-brothers. In 934 Haakon, a younger son of Harald, was summoned from England and, with the help of Sigurd, drove Erik into flight from Norway. Haakon restored to the Norwegians the rights and liberties of which they had been deprived; but although his attempts to convert his subjects to Christianity failed, his reign was for the most part peaceful despite a dangerous relaxation of central control. In 961 Haakon was killed in combat with Dan. invaders led by Erik and, in the ensuing years, Norway was much disturbed until the arrival of Olaf Tryggvason, grandson of one of the murdered half-brothers of Erik. Olaf, who had been a well-known viking leader and was a man of splendid physical endowment and great energy, was the founder of Nidaros (later called Trondheim), for many years the Norwegian cap. After a reign of only five years he perished in a seafight with Dan. and Swedish ships under Earl Erik, son of Haakon, and the kingdom was then divided for the most part between the Swedish and Dan. kings and Earl Erik. Another seafaring king like Olaf Tryggvason was Olaf Haraldsen, a descendant of Haarfagre, who came to the throne as Olaf II. c. 1015. Olaf II.'s policy was the double one of establishing both the royal power and the Christian Church on a national basis in opposition to the local chieftains who were claiming dists. by hereditary title. But though he strictly enforced the laws and gave Norway comparative stability,

he too was doomed to perish at the hands of his foes, being killed at the battle of Stiklestad (1030). This victory, however, served to increase the influence of Denmark whose king, Knut, sent Svend Knutson to rule as viceroy. On Knut's death in 1035 Knutson was expelled and Magnus, son of Olaf II., was brought from exile in Russia. Olaf II. is commonly reputed to have been the first to awaken a national consciousness and came to be regarded as the national champion, while his zeal for the Church sanctified his memory, so that later he was extolled as the patron saint of Norway. On Hardknut's death (1042) Magnus inherited the crown of Denmark. He made his nephew Svend Estridson his viceroy, but the latter, with the aid of Harald Haardraade, tried to secure his own independence. Haardraade, who was a half-brother of Olaf and a great warrior, came to terms with Olaf and together they ruled Norway. Under Olaf III. (Olaf Kyrr), son of Haardraade (killed at Stamford Bridge, 1066), Norway enjoyed peace and prosperity. Sigurd, a son of Magnus, was the last of the line of Harald Haarfagre to wield undisputed sway over Norway, and with his death ended what has been called the 'classic period of Norwegian hist.'

After the death of Sigurd there ensued a long period of internecine strife over rival claims to the throne, and in these conditions the power of the aristocracy and the political influence of the Church both tended to grow at the expense of the king. When Magnus V., son of Erling Skakke, who was not of royal blood, was chosen king in 1161 it was thought expedient that the archbishop of Trondheim should crown him and thereby at least make the kingship nominally dependent on the goodwill of the Church. In 1181 Magnus was defeated and killed on the Sognefjord by the Birkebeinar, desperate armed followers of Sverre, who claimed to be of royal descent. Sverre, an able and strong ruler, set out to make the royal power supreme over both national Church and State, and his efforts to achieve his purpose were largely successful by the time of his death (1202). Pretenders to the throne were not finally crushed until 1240. Haakon Haakonson (Haakon IV.), however, succeeded Sverre and ruled until 1263. It was during his long reign that Iceland became directly dependent on Norway, but an attempt to bring the Hebrides and other Scottish is. into the same relationship utterly failed and they were ceded later to Scotland by Magnus VI. in whose reign the relations of the crown with the old aristocracy were to some extent improved. Erik, his son and successor, d. in 1299. His only child, the 'Maid of Norway' was drowned on the way to Scotland and the crown then passed to Haakon Magnusson (Haakon V.), his brother. Haakon V. left no son and the crown then (1319) passed through his daughter to the reigning house of Sweden. The child Magnus VII., hereditary king of Norway and grandson of Haakon V., was elected king of Sweden in 1319, so that the two

kingdoms became nominally united. From that time until the twentieth century the hist. of Norway is inextricably interwoven with that of other parts of Scandinavia. The union, accidental in its origin, was so unsuccessful that it was arranged that Haakon, younger son of Magnus, should reign over Norway. Haakon VI. d. in 1380 and Margrete, his wife, daughter of Valdemar, king of Denmark, acted as regent in both countries, even after her son's (Olaf) death in 1387. In Sweden Albert of Mecklenburg, who had been chosen to replace the deposed Magnus, became so unpopular with his nobles that they asked Margrete to assume power, and in 1389 Albert was defeated by her army at Falköping and Margrete was now *de facto* mistress over all Scandinavia, while in 1397, by the union of Kalmar, the three countries were declared to be 'eternally' united under one sovereign.

After 1412 Sweden revolted against the union because the more important posts were held by Dan. nobles. Christian of Oldenburg (Christian I.) who succeeded to the crown of the three countries in 1448 could not establish his power over Sweden and, in 1523, Sweden finally seceded from the union. In 1525 the Danes set up the duke of Holstein as king with the title of Frederick I., but his zeal for Lutheranism made enemies of the Church in Norway. Frederick d. in 1533 and Christian III. was chosen king by the Dan. council. He too was an extreme Lutheran, but an attempt by the opposition, under Archbishop Olaf Engelbrektsson (or Engelbrechtsson), to reject him having proved abortive, Norway became practically a prov. of Denmark. The people, who were scarcely more numerous than in the years preceding the Black Death, being too scattered in remote settlements to have any true understanding of political conditions. Thus Norway had to, all intents ceased to exist as a sovereign state and for a long time appeared only in Dan. hist. It was concerned only indirectly with the wars in which Deumark, under Christian IV., became involved, but its actual disintegration seemed to be imminent when, in the disastrous war of the Danes under Frederick III., Trondheim was lost to the Swedes (1658). But the Norwegians asserted themselves and most of the lost ter. was soon recovered. Norway's fortunes began to revive with the growth of her maritime trade during the wars of the Dutch with the Eng. and Fr. But in 1717-18 Norway was invaded by Charles XII. of Sweden, whose purpose was to obtain a portion of ter. with which to negotiate peace with his enemies; but in the result Sweden's power was so weakened that she no longer constituted a threat to her Scandinavian neighbours.

During the Napoleonic wars Norway was faced with economic chaos and famine owing to her dependence on blockaded Denmark. In 1810 the Fr. marshal, Jean Bernadotte, was elected king of Sweden as Karl Johan and the old king (Charles XIII.) being infirm, Bernadotte became the effective power. Bernadotte's

candidature was popular in Sweden owing to his kindness to Swedish prisoners during the war with Denmark. But as king of Sweden he was almost necessarily led into tortuous ways and now made the acquisition of Norway the keystone of his whole policy, his aim being to divert the popular ambition of Sweden from the conquest of Finland. This project received support from England and other powers in consideration of Sweden's aid against Napoleon. Norway was then again the victim of blockade, and national bankruptcy soon followed. After his success at Leipzig Bernadotte defeated the Danes, and under the ensuing peace treaty of Kiel (1814) the king of Denmark renounced all rights in Norway, though the Norwegian dependencies, Iceland, Greenland, and the Faeroes were reserved to Denmark. The Norwegian people, however, who were not consulted on this arrangement, were intensely hostile to it. The result was that Prince Christian Frederick, next in succession to the Dan. king, was sent to Norway as regent. He soon abdicated, and Norway was at length declared, 'a free, independent, indivisible, and inalienable kingdom united with Sweden under one king,' under the Act of Union of Aug. 6, 1815. This second union with Sweden, which was maintained from 1815 to 1905, was purely personal in the sense that the king was the sole connecting link.

The two states had their separate and very different systems of government, defence, finance, and laws, and their economic and political interests were diverse and often antagonistic. The Norwegian view was that the two states were intended to be on a footing of absolute equality, but the Swedes claimed that Norway was ~~not~~ more than ceded ter. enjoying only a nominal autonomy. Only after the accession of Oscar II. in 1872 did the situation become less strained. Under the Liberals, in 1883, the king yielded to the Norwegian desire that the ministers and state councillors should have the right of access to the Storting and of participation in its debates, thereby establishing ministerial responsibility in Norway. But Norway still had no foreign minister and claimed that her divergent economic interests entitled her to have separate consular services. In 1892 and 1898 these questions brought Norway and Sweden to the verge of war. In 1905 the Norwegian ministry of the day resigned following the king's (Oscar II.) veto of a measure for a separate and independent Norwegian consular service and his refusal to form another gov. The Storting then claimed that Oscar had abdicated his constitutional functions and ceased to be king of Norway, and that the union with Sweden was at an end. This was confirmed by a Norwegian referendum by 259,563 votes to 69,264 against, and a treaty was signed at Karlstad, Oct. 6, 1905, defining the terms of separation, including the delimitation of a 'neutral' zone, and Norwegian fortifications were dismantled. There was a small popular demand for

establishing a republic, but the peasantry were one strong factor against it, and the Storting chose Prince Charles, second son of the then Crown Prince Frederick of Denmark to be king. He was elected by referendum (Nov. 18, 1905) and was crowned as King Haakon VII. on June 22, 1906, in Trondheim cathedral. Princess Maud Alexandria, the youngest daughter of Edward VII. of England, his consort, became queen.

In the First World War N. adopted an attitude of strict neutrality, but her timber and mining industries suffered heavy losses and the national debt increased enormously, speculation became widespread, wages rose with the cost of living, and this economic confusion was enhanced by the fall of the currency. Victories at the election of 1927 gave the Labour party fifty representatives in the Storting and a Labour Gov. was formed in 1928, but it soon went out of office with the threat of complete disarmament and financial chaos. Unemployment reached its highest point during the time of the Liberal Gov., under Mowinckel (1933), and when this gov. was defeated it was succeeded in 1935 by an all-Labour Gov.; but the Labour party had learned its lesson and increased the vote for defence (1937). In 1920 Norwegian sovereignty over the Spitsbergen Archipelago (known as Svalbard) was affirmed by international treaty. A long-standing dispute over Greenland came before the International Court of Justice at The Hague but the Court upheld Denmark's claim (1933). In 1939 N. annexed part of the Antarctic coast between 20° W. and 45° E., the land within, and its territorial waters.

On April 9, 1940, the Ger. minister at Oslo presented a series of demands to the Norwegian Gov., e.g. that the gov. should appeal to the people and army to refrain from resisting the Ger. troops. But already sev. hours before these demands were delivered, Ger. forces had begun the attack on Norway. Norway refused to submit to the Ger. demands. Naval and military operations were carried on against overwhelming odds by the brave Norwegian Army assisted by Brit. and Fr. forces until June 10. After the Gers. opened their offensive on the W. front the Allies gave notice that they must withdraw their forces from N. Norway. The Norwegian Gov. decided therefore on June 7 to end the defence of N. Norway two days later at midnight, and continue the fight outside Norway. The king and members of the Norwegian Gov. were in London on June 10. The Gers. took over the administration assisted by an administrative council. On Sept. 25 the Ger. Reich's commissar for Norway by a decree excluded the king, the legal gov., and all political parties, and estab. a council of commissioners of the Quisling (q.v.) party. On Feb. 1, 1942, the Ger. commissar appointed Vidkun Quisling, the notorious Norwegian traitor, as 'minister president' of a puppet gov., an appointment at once repudiated by the *de jure* Norwegian Gov. in London.

One of Quisling's first acts in the in-

terests of his new masters was to attack the schools and teachers in the vain hope of 'nazifying' them; but, apart from alienating the teachers, he came into conflict with the State Lutheran Church. He also tried to establish a corporative assembly, called the *Riketing*, on the model of the Ger. *Arbeitsfront*, but most of the workers resigned from the trade unions which were to form the new labour front and Quisling had to abandon his plan. The usual Ger. repressive measures, as put into operation in other occupied countries, followed in 1943 in the shape of concentration camps, labour conscription, and police purges. The Nazi rector of Oslo Univ. tried to assume dictatorial powers over the admission of new students regardless of their academic qualifications. The students resisted, and the consequence of their hostility was relegation to a concentration camp and the closing down of the univ. But from outside Norway the Norwegian Gov. continued to direct the growing participation of Norway in the allied war effort. The Norwegian Navy was strengthened by an increase in its personnel to over 5000 men. Corvettes carried out much convoy work; Norwegian fighter planes had shot down 137 Ger. planes by the end of 1942, and the Norwegian Army continued its intensive training. In 1944 (Jan.) Norwegian patriots discovered that Quisling had promised Hitler that he would mobilise 75,000 young Norwegians for military service with the *Wehrmacht*. The unmasking of this plot compelled the Gers. and Quisling to postpone its operation for some months and when they did begin to put their plans into execution the struggle against mobilisation was effectively assisted by sabotage on the part of the increasing resistance movement. In the years of the Ger. occupation the financial burden on Norway was very heavy, and was higher in proportion to the pop. than in any other occupied country.

In Oct. 1944 the Red Army, pursuing the retreating Gers. from Finland, crossed the Norwegian border and took Kirkenes, the vital base from which the Gers. had directed their attacks against the convoys to Murmansk. They soon cleared the Varanger Peninsula, and by the close of the year nearly half of the county of Finnmark was liberated. Inside this area some 25,000 Norwegian civilians, who had succeeded in evading compulsory evacuation, set about the task of repairing their damaged tns. and vls. Norwegian forces all through 1944 helped not only in preparations for the liberation of Norway, but also in the general allied offensives against the Reich. On May 7, 1945, Gen. Bohme, Ger. commander-in-chief in Norway, broadcast Germany's surrender, and the Norwegian home forces took over strategic points all over the country. By Sept. some 225,000 Gers. had been evacuated; the Russian forces in N. Norway returned home in the same month, while Amer. and Brit. forces left before the end of the year. King Haakon returned to Oslo on June 7. After the liberation the collaborators were brought to justice. Quisling himself, and others, were executed.

Knut Hamsun, the novelist and Nobel prize-winner, who had actively supported the Germans, was arrested, but the capital charge against him was dropped because of his mental deterioration; he was heavily fined. In the parl. elections of Oct. the Labour party, already the largest in the Assembly, increased its representation to 76 out of 150, thus securing a majority over all other parties.

Reconstruction was soon set on foot. An expansion of hydro-electric power was projected, with new plants of 425,000 kWh. Also was begun the construction of iron-works at Mo-i-Rana in N. Norway, at a cost of 200,000,000 kroner, as well as twelve new factories for fish-drying and salting. Clearly, however, Norway could



Royal Norwegian Embassy

THE RETURN OF KING HAAKON
Karl Johansgata, Oslo, June 7, 1945.

not plan in isolation and the main problems lay in the field of collaboration with Scandinavia and the W. nations. Norway had been a member of U.N.O. from its inception, and a Norwegian, Trygve Lie, became secretary-general of the organisation in Feb. 1946. In Feb. 1948 Norway announced her agreement with the aims of Marshall Aid (q.v.), and undertook to participate in the economic co-operation of the sixteen Marshall Aid countries. In addition there was set up a Joint N. Committee of N. Denmark, Sweden, and Iceland for economic affairs and to consider the eventual estab. of a N. Customs Union. In Oct. 1948 Norway received from the Economic Co-operation Administration a loan under the European Recovery Programme of \$35,000,000. The total of Amer. aid in 1948-49 amounted to \$84,000,000. Norway also entered into the intra-European payments scheme. A joint Anglo-Norwegian committee was

estab. in March 1949 for mutual co-operation on economic matters.

In matters of political alignment it was ultimately estab. that Norway would take her place amongst the W. nations. Although in 1947 a three-year plan, for the reorganisation of defence had been drawn up, the experiences of Ger. occupation decided that Norway must seek security, as well as economic stability, in concert with others. This did not, however, prevent the rejection of an Amer. proposal to place Antarctica under international administration: Norway expressed her readiness to participate in international scientific exploration of the area but wished to retain the sovereignty of her sector. Negotiations were opened in Nov. 1948 to set up a military pact for the collective defence of Norway, Sweden, and Denmark, but a fundamental difference of view became apparent. Sweden, who had been able to preserve her neutrality in the Second World War, and who was, moreover, so closely situated to Russia, wished this union to remain strictly a neutral bloc; Norway, a Ger.-occupied land, and with a geographically Atlantic outlook, insisted that she was a part of W. Europe. Denmark's views were midway between the two, but nearer that of Norway. Ultimately, therefore, the plan was abandoned, and Norway joined the N. Atlantic Treaty (q.v.) which later she ratified in July 1949. Simultaneously with the decision Norway rejected, as being unnecessary, a Russian proposal for a non-aggression pact. In May Amer. defence assistance was requested in accordance with the principles of the treaty. In May 1949 Norway signed the Statute of the Council of Europe. In the election of Oct. 1949 the Labour party was again returned to power, with a further accession of strength at the expense of the Communists, who did not win a single seat.

Music.—No national music was written in Norway until the Romantic Movement began in 1840 with the 'national revival' in which Ludvig M. Lindeman (1812-87) collected many of the rural melodies which had survived through the Dan. period. Some of these tunes have connections with the *kjempesirer*, ballad material common to all Scandinavia; the *springdans* is the same as the Swedish polka. However, two Norwegian dances, the *gongar* and *halling*, have no parallel, and their rhythms have inspired most Norwegian composers. In vocal music, too, Lindeman found strange medieval survivals, reminiscent of old church chants, yet showing even older, simpler structure. The influence of this vocal music on the *kjempesirer* produced music of almost monumental character; in addition to these heavy melodies there are light, airy embellishments of the melody arising from the peasant love of the patterns of unison music. This, together with the surprising rhythm, created a unique Norwegian folk music, knowledge of which is essential before Norwegian classical music can be understood. The most typical instruments were the *langleik*

(plucked strings) and the *hardingfele*, the eight-stringed violin.

Ole Bull (1810-80), the violin genius, was the first great name in Norwegian music, though he only wrote down two tunes. Halfdan Kjerulf (1815-68) was the first composer, the founder of romanticism. The springlike work of Rikard Nordraak (1842-66) included many songs, and the air of the national anthem.

The composer who is inseparable from Norwegian folk music is, of course, Edvard Grieg (q.v.) (1843-1907). Among his contemporaries were Johan Svendsen (1849-1911), restrained classical composer; Christian Sinding (1856-1941), disciple of Wagner; and the female pianist and composer of songs Agathe Backer Grindahl (1817-1907).

The founding of the Philharmonic Society in 1919 gave new scope for major orchestral works. With main emphasis on national themes Harald Saeverud (1897) and Klaus Egge (1908) have written works which have won international repute. Composer of atonal music is Fartein Valen (b. 1887) the most learned of Norwegian composers to-day, Ludvig Irgens Jensen (b. 1894) most known for his magnificent symphony *Heimferd* is a conscientious and highly gifted composer of works of great formal beauty.

Literature.—The literature of Norway cannot be taken as a whole; for the old sagas, the poetry, and historical legends were written in old Norse, which was the language of the colonists of Iceland from Norway, and is so bound up with Icelandic literature that it cannot be separated therefrom (see ICELAND, *Literature and Language*). Similarly, till well on into the nineteenth century, the sources of Norwegian literature must be found in Denmark and in Dano-Norwegian, though many of the greatest writers, such as Holberg, Tullin, and Wessel, were Norwegians by birth. The separation of Denmark from Norway constitutionally in 1814 must be the starting-point in a brief outline, giving the names of the more outstanding figures, many of whom are treated in separate articles in this work. The poets of May 17, 1814, the inaugural day of Norwegian independence, the 'Trofoil,' Conrad Schwach (1793-1860), Mauritius Hansen (1794-1842), and Henrik Bierregaard (1792-1842), did much for the new school; but the greatest early figures were Henrik Wergeland (1808-45), a poetic genius of national tradition who also preached universal values, and his great opponent Johann Welhaven, classicist and conservative (1807-73). Wergeland's sister, Camilla Collet (1813-95), was an early realistic novelist, and her great novel, *The Governor's Daughters*, is a landmark in the women's suffrage movement. The most important event in nineteenth-century literature, however, was the national revival. It was a period of large-scale rediscovery of the old medieval songs and tales. Perhaps the most significant work was done by the linguist and vernacular poet Ivar Aasen (1813-96) who traced the connection between the

various dialects and Old Norse and whose grammar and dictionary form the basis of the *Landsmål* movement which aims at eventual unification of the dialectical elements in Nynorsk (and what is known as Samnorsk). Aasmund Vinje (1818-70) wrote fine lyrical poems in the vernacular medium, and, incidentally, wrote a report on Britain, *A Norseman's Views on Britain and the British* (1863).

Of the next period the great names are those of Henrik Ibsen (1828-1906) and Björnstjerne Björnson (1832-1910), whose reputation and influence were world wide. Ibsen's first plays, such as *Warriors of Helgeland* (1857), borrowed their themes from national legends; but the early *Lady Inger* (1855), with its strong characterisation, more clearly foreshadowed his later triumphs. Yet even at this time he showed himself to be violently hostile to tradition and orthodox opinion, his *Lore's Comedy* (1862) ridiculing the hypocrisies of domestic life. In 1865, while abroad in voluntary exile from the storm of abuse he had aroused, he wrote his great poetic drama *Brand*, a study of a saint who sacrifices all for his fanatical faith, and soon afterwards *Peer Gynt*, his most popular and influential dramatic poem. These won him instant fame and a gov. pension. In 1877 he began to write the series of prose plays on which his international reputation rests, and his work took mainly the form of political and social satire, for which he found abundant themes in the smug and narrow provincialism of the urban life he knew. Thus *A Doll's House* (1879) turns on the awakening of the sense of individual responsibility in a woman who has always been treated as a spoilt child, and an equally famous play is *The Wild Duck* (1881), a satire on unpractical idealism. In technique the first of these two plays marks a turning-point in the hist. of European drama. Naturalness of dialogue and situation, adherence to the unities of time and place, the disappearance of soliloquy, the avoidance of the conventional happy ending, are all so familiar to-day that we are apt to forget that these fundamental changes are due to Ibsen. One strong ground of criticism of Ibsen was that he seemed unable to keep away from the topic of disease in its hereditary aspect, as in *Ghosts* which appeared in 1881, and again, that his philosophy of life was too uncompromising. But whether his beliefs were justified or not he made people think and he swept away the fashionable, complicated plots which had no relationship to everyday life. In a word, he brought ethics and sociology to the stage without offering quack remedies to secure an unreal denouement, his later pieces being in this respect a great contrast to such plays as *The Pillars of Society* (1877) which, while adhering to his salient idea that absolute truth at any cost is essential in life and in society, reveals some of the faults of the 'well-made' play demanded by convention. His later works are *Hedda Gabler* (1890); *The Master Builder* (1892); *Little Eyolf* (1891); *John Gabriel*

Borkman (1896); and *When We Dead Awaken* (1900); all are chiefly developed from ideas contained in his earlier works. (See also under IBSEN.) Björnson gave life to conventional characters, but never shook off the influence of Scribe. Like Ibsen he took the problems and tragedies of everyday life as themes for his later plays, such as *Leonarda*, the story of a woman who falls in love with her adopted daughter's fiancé and goes away so as not to wreck the girl's happiness; *The Editor*, an attack on unscrupulous newspapers; *A Bankruptcy*, on the tyranny of big business. But Björnson handled his themes differently from Ibsen and was essentially a humanitarian whose views were obvious, while he manufactured evidence to prove a case, and some of his characters are really only illustrations of an argument. He lacked Ibsen's concentrated technique and creative imagination; but the passionate honesty of his own character was expressed in the appeal in his plays for a higher standard of truth in journalism, in finance, in monarchy, an appeal for less casuistry and more truth. His novels are generally on pastoral life and contain some of the most delicate pictures of peasant life in modern fiction. Others are psychological novels, on heredity and education (see further under BJÖRNSON).

Of this period was also Jonas Lie (q.v.). Lie (1833-1908) was not a great creative artist, but stories like *The Commodore's Daughter* (1892) and *Dyre Rein* (1896) are skilfully narrated and show great power in identifying himself with the peculiarities of Norwegian sentiment. His style, almost too colloquial, lacks the charm of Björnson and the art of his successors. Alexander Keilland (1849-1906) a writer with a subtle ironic touch, wrote novels of great force and vitality, attacking social and moral prejudices. A few years younger is Arne Garborg (1851-1924) who was early the recognised leader of the *Landemål* movement and the president of *Det Norske Samlaget*, a literary society formed in 1868 for the propagation of the *landemål* (New Norse) as a literary language. His novel, *Peasant Students* (1883), the theme of which is the danger of giving up one's culture for social advantages, is an important commentary on Norwegian national hist. As a dramatist he achieved some success with his *Irreconcilables* (1888), a play on political corruption. But it was as a poet that Garborg won his greatest success, his *Haugtussa* (1895), the story of a peasant girl with second sight, taking rank among the masterpieces of Norwegian literature.

Modern Norwegian literature has not surpassed the high level of that of the last decade of the nineteenth century. Though there are many well-known names, they have not reached the international standard of Ibsen, Björnson, Garborg, or Lie. The form chiefly adopted has been the novel, especially the naturalistic, inspired by Fr. and Russian models, and poetry has occupied an important place. The early nineties were notable for a

reaction against the rather tedious problem novel, while some attention was paid to lyric poetry of an indeterminate character. But out of this transition period rises the most dominating modern figure in Norwegian literature, that of Knut Hamsun (b. 1859). Hamsun utilised his experiences as an emigrant to America and of the harsh conditions of life in the Lofoten Is. to produce the remarkable novel *Sula* (*Hunger*, 1921), a novel of the psychology of starvation and of the reactions of a hypersensitive soul to environment. His work is characteristic for its vitality and extreme subjectivity. *Pan* (1920) has a great poetic beauty. *Makrins Grøde* (*Growth of the Soil*, 1920), a study of man against nature, is his greatest novel. Almost equally popular is Johan Bojer (b. 1872), the sober pragmatist and the antithesis of prose-poets like Hamsun and Hans Kink (1865-1926). He is typically national in thought and language. His favourite theme is the intense preoccupation of his fellow countrymen with politics in its devastating consequences on the home. His best novels are *Den Store Hunger* (*The Great Hunger*, 1918), *Liv* (*Life*, 1911), *Dyrendal* (*God and Woman*, 1919), and *Den Siste Viking* (*The Last of the Vikings*, 1921). With a greater depth and veracity than Bojer, though lacking his narrative style, is Sigurd Christiansen (b. 1891). Kink is regarded as the conscious linguistic artist who seeks his character studies in the peasantry of the fjord dists. and employs their dialect to lend colour to their intense, if animal life. His best known novels are *Sneskavlen brast* (*The Avalanche*, 1918-19), and *Driftskaren* (*The Cattle Dealer*, 1908), which latter is considered to be one of the greatest of Norwegian national dramas, full, as it is, of terrific grandeur. A calmer mentality pervades the work of Trygve Andersen (1866-1920), whose prose style of classical purity matches the monotony of his themes. His *Cancelliraadens Dage* (*In the Times of the Court Councillor*, 1897), short stories, and *Mot Kreid* (1900), which treat of aspects of social decay, are his most notable works. Peter Egge (b. 1869) who, like Strindberg, is for ever dwelling on the personal conflict between man and woman, also enjoys considerable popularity. Amongst his prolific writings are *Inde i fjordene* (*By the Deep Fjords*, 1920); *Jægtvig og hans Gud* (*Jægtvig and his God*, 1920); *Hansine Solstad* (*Hansine Solstad, the History of an Honest Woman*, 1929). Of the still more recent novelists, the best known is Sigrid Undset (1882-1949) whose *Jenny* (1911), a novel on family life in a moralist vein, achieved great success, but which in the opinion of her fellow countrymen has been easily surpassed by such later work as her historical trilogy *Kristine Larransdatter*, *Kransen* (*Garland*, 1920), *Husfrue* (1922), and *Korset* (1922), a novel portraying the Norway of the fourteenth century. Her later work, after her conversion to Catholicism, includes *Den braendende busk* (*The Burning Bush*, 1932) and *Madame Dorthea* (1940).

Another twentieth-century novelist is Cora Sandel. Of the 'New Norse' school a conspicuous figure was Jens Tvedt (1857–1935), who depicts the westland peasants' life in a wealth of dialect idiom. In contrast with the objective realism of Tvedt, as exemplified in *Madli un' Apalen* (*Madli under the Apple Tree*, 1900), is the subjective moodiness of Rasmus Lolland (1861–1908), whose stories of child life have won high praise. Among *riksmaal* writers are Andreas Haukland (b. 1873), a prose-poet of the Arctic shores, and Hans Aanrud (b. 1865), who paints the folk life of the eastland with a quiet humour rare in Norwegian literature. Among the regional prose writers is Olaf Benneche (b. 1883), an historical novelist. Perhaps the outstanding lyric poet of modern Norway is Arnulf Overland (b. 1889), whose fastidious sense of words is complemented by a strong passion for social justice; he was one of the earliest opponents of Nazism. Other modern lyrical poets are Nils Vogt (1864–1937), whose reflected poetry is unequalled in Norway, and Olaf Bull (1883–1933), whose poetry recalls that of Keats and Herman Wildenvey (b. 1886), a *plein air* singer. Tore Ørjasæter (b. 1886) is a lyric-epic poet of great sincerity. In the field of narrative poetry must be mentioned Olaf Aukrust (1883–1929), a visionary *landsmaal* poet whose *Himmelvarden* (1916) forms an impressive collection of religio-philosophical poems. With Olaf Duun (1876–1939) *landsmaal* came into its own; in his deep insight into the peasant character Kristoffer Uppdal (b. 1878) portrays the labouring classes in the same medium. Nils Kjaer (b. 1870), one of Norway's few notable essayists, exhibits considerable diversity, and has also produced successful comedies. The most conspicuous of modern Norwegian dramatists was the aristocratic individualist Gunnar Heiberg (1857–1929), whose *Balkonen* (*The Balcony*, 1894) and *Kjærlighedens Tragedie* (*The Tragedy of Love*, 1904) are considered to be Norwegian classics. Of more recent drama the most important work has been by Holger Krog (b. 1889), and by Nordahl Grieg (1902–43) who was shot down over Germany. Norway thereby losing a playwright and poet of great promise.

Art.—Prehistoric pictures still exist in Norway, similar to the cave paintings of the Pyrenees: bold, naturalistic scenes of elk and reindeer hunting, of whaling and fishing. With the dawn of civilised society came the formation of a definite national style in art, evolving from the rhythmical Celtic carving known all over Scandinavia and in Celtic Britain. This style was influenced not directly by Greece and Rome, as with the rest of Europe, but by all manner of local arts discovered (and plundered) by the Vikings. Then, as to-day, it was rich dramatic contrast which characterised Norwegian art. Even after the decline of Norwegian power in the Middle Ages, the stately Gothic style imported from the S. was superimposed upon this dramatic Norwegian element—literally so in the carving in the 'Stave'

churches of Sognefjord. However, at the collapse of the Norwegian state, art styles became scattered and localised, developing and continuing in different ways in small areas.

When independence returned, in the nineteenth century, all these localised styles became the tribus of a renewed stream of Norwegian style in art. The lively landscape work of I. C. Dahl was the first recognisably Norwegian art of the modern age; natural romanticism predominated, as in the work of Fearnley, Gude, and Tidemand, the great portayers of peasant life.

It was not long before the tide of Fr. Impressionism swept in, strengthening the dramatic quality of colour and style even more. The 'most dramatic and explosive force' in all Norwegian art, produced by this period, is Edvard Munch, 'the Viking with the whole high-tensioned soul of our age.' A similar national synthesis of style is sought for in the world of sculpture by Gustav Vigeland, who created the vast fountain project in Oslo's largest park, comprising scores of individual and group sculptures. For some years Vigeland practically monopolised Norwegian sculpture, and only since about 1920 has a new school appeared, under the teaching of Rasmussen, and including Seland, Pettersen, Vaa, and Dagfin Werenskiold. At the same time painting has produced many artists whose expressionistic use of colour is linked with the traditional dramatic style: Thorvald Erichsen's sunshine-filled works have peculiarly soft, rich, and tender colouring, while Ludvig Karsten fills his canvas with shattering colours and vibrating light, in contrast with the severe linear style and clear colouring of Harald Sohlberg; the emotional nature scenes of Nicolai Astrup contrast with the grim city paintings of A. C. Svartstad; some of the liveliest portraits have been produced by Henrik Lundh. Monumental artists, largely influenced by Matisse, include Sørensen, Krohg, and Revold (frescoes in Bergen Stock Exchange, 1918). In late decades the contrasting elements of national romanticism and international classicism seem to have succeeded in combining to form something typically Norwegian in painting style. Modern Norwegian painting strikes one as a daring and highly talented experiment in colour. The younger phalanx, among them Midelfart Lie Jorgensen and Steen Johnsen carry on the exploration of Norwegian landscape. Especially the district of Telemark, with its richness of light effects, has attracted a wide range of artists. A very vigorous painter with a keen sense of social injustice is Reidar Aulie, but perhaps the most outstanding of all are Kai Jell and Arne Egelund who, the former with his cult of fertility, the latter with his revolt, both carry on the Munch tradition.

See also NORWAY AND DENMARK, GERMAN INVASION OF (1940).

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Norway and Denmark, German Invasion of (1940). In March 1940 Prof. Koht, Norwegian Prime Minister, was sending protests to Germany against the sinking of Norwegian ships, just as earlier he had protested to the Brit. Gov. against the brilliant Brit. naval feat of rescuing some 300 Brit. prisoners from the *Allmark* (see NAVAL OPERATIONS). With equal energy he was now, early in April, protesting against all violations of Norwegian neutrality from whatever side they might come. Like other neutrals Prof. Koht was living in an unreal world, which had no place in the totalitarian conception of international relations. It is, however, more than probable that he was so terrified of Germany that he was morally compelled to disregard the lessons of earlier victims of Germany. Ger. U-boats were now flagrantly ignoring Norwegian neutrality by sinking ships in their territorial waters, among them, scores of Norwegian vessels. The Allies, therefore, countered these violations by laying mines in Norwegian waters, which mine-laying also served the useful purpose of checking supplies of iron-ore coming down from Narvik through these waters

to Ger. ports. The Norwegian Gov. protested against this violation of international law by Britain much as a householder might protest against a police officer for smashing his fence in order to arrest a murderer. But the ink of this protest was scarcely dry before Germany invaded Norway in such circumstances of time and equipment as made it abundantly clear that the attack, far from being an unpremeditated retort to the Allies' minelaying, had been planned for months beforehand, even to such details as the construction of special landing barges for troops. Moreover the decoying of the Brit. Navy northwards towards Narvik while the Ger. transports were carrying troops across the Skagerrak was also a manoeuvre that required time to prepare and effectuate. The excuse for the invasion of Denmark and Norway was the 'hunger blockade' of the Allies and their violation of 'the concept of neutrality.' The Reich Gov. also declared that it had indubitable evidence that the Allies intended to occupy certain parts in the N. states within the next few days, 'an ingenious travesty of the fact that during the Russian invasion of Finland, the Brit. Gov. would have sent an expeditionary force to Finland but for the Scandinavian Gov.'s refusal to allow it to cross their frontiers.' Dr. Goebbels's broadcast on April 9 to the Ger. people that Norway and Denmark had been 'taken under the protection of the Reich to forestall allied occupation,' and identical proclamations to the armed forces and people of Denmark and Norway, were made by the respective Ger. commanders of the invading forces in those countries. At dawn on that day strong mechanised Ger. units crossed the Schleswig frontier near Flensburg and Tonder and proceeded to the rapid occupation of the whole country, which was accomplished within a few hours without encountering any organised resistance. Simultaneously Ger. troops were landed from warships and transports at Copenhagen, Korsor, and other places. The Ger. invasion was accepted by the Dan. Gov. under protest and they and the king called upon the people 'to adopt a calm and controlled conduct,' declaring it to be their duty to refrain from resistance. In fine, the Danes were justifiably afraid of having their tns, open or otherwise, laid flat by Ger. bombers if they made any show of defence. The Norwegians, on the other hand, refused to accept the Ger. ultimatum and their gov. ordered a general mobilisation. But already the Ger. had landed troops at Bergen, Stavanger, Trondheim, Egersund, Narvik, and other places and all these tns. were soon in their hands. Troops were also landed in Oslo Fjord. These Ger. landings were effected by Ger. marines disguised as merchant seamen, who had previously arrived at these ports in Ger. cargo ships. They quickly overpowered the port officials by means of hand grenades and seized the key buildings and aerodromes. The Norwegian Parliament and King Haakon and the royal family left Oslo

for the N., aided by the failure of the naval invasion of the cap. In the late afternoon Oslo was occupied by the Gers. as a result of surprise airborne landings. The Norwegian coastal batteries in Oslo Fjord fired on Ger. naval units which were forcing their way to the cap, by that route, and sank the cruiser *Blücher* and the gunnery training ship *Brummer*. During an attack on the Horten Fort, near Kristiansand, the Ger. cruiser *Karlsruhe* was sunk. Meanwhile Narvik had been taken after resistance by two old Norwegian defence vessels had been overcome by ten Ger. destroyers. Brit. naval and air forces promptly counter-attacked and a number of Ger. ships, including transports, were sunk (see NAVAL OPERATIONS). On April 10 a Brit. destroyer flotilla under Capt. Warburton-Lee (killed in action and posthumously awarded the V.C.) made a most successful attack on a number of Ger. destroyers in Narvik waters and on April 13 another strong force of Brit. destroyers under Vice-Ad. Whitworth sank four Ger. destroyers in Narvik Bay and pursued and destroyed three others. The previous day air operations were carried out by the Brit. Air Force and Fleet Air Arm against Bergen, Trondheim, Stavanger, and Kristiansand. Brit. troops were landed at sev. points on the Norwegian coast and more Ger. transports were sunk, while the Ger. pocket battleship *Admiral Scheer* was hit by a torpedo. At the same time a Polish submarine, the *Orzel*, serving with the R.N., torpedoed the Ger. transport *Rio de Janeiro*. The R.N., however, sustained losses, including the submarine *Thistle*. An allied force under Maj.-Gen. Carton de Wiart, V.C., effected a landing at Namsos and advanced in the hope of capturing the Trondheim-Namsos railway line. Ger. landings were, however, made in Trondheim Fjord, and heavy Ger. counter-attacks were delivered by these troops in the Trondheim area (April 23), and later the Gers. captured the important position of Stenkjer, while the Allies were forced to withdraw from positions near Lillehammer, it being evident that the Gers. would make every effort to establish contact between their forces N. of Oslo and those in the Trondheim area by a thrust up the Osterdal valley. Early in May Chamberlain announced that the Brit. troops in S. Norway had been withdrawn from Aandalsnes, the Brit. Gov. having decided that they must abandon any idea of taking Trondheim from the S. Brit. losses, however, were slight on land, but, on the sea, during the three weeks that had now elapsed, the R.N. had lost four destroyers, three submarines, one sloop, and five trawlers. The Ger. losses at sea were, however, so heavy that they permitted of an important redistribution of the main allied fleets. In the following month the Allies withdrew from N. Norway, losing the aircraft-carrier *Glorious*, besides two more destroyers in the operation of embarkation. The loss of Narvik was important both from a material and psychological standpoint, for it was from this port that the much-needed

Swedish iron-ore was shipped for Germany, though before abandoning it the Brit. forces had prevented the use of the port for some time; and furthermore, the abandonment of the whole Norwegian adventure, superadded to the fact that the Allies had been foisted by the Gers., involved much damage to allied prestige. This failure led to a most acrimonious debate in the House of Commons in which the Chamberlain Gov.'s whole conduct of the war from the very beginning was so severely criticised that its majority sank to a figure that must involve resignation. Members of all parties called for a drastic reconstruction of the gov. with the result that Chamberlain resigned and was succeeded by Churchill. It is not a little curious that the Brit. Gov. did not foresee the Ger. attack on Norway. The concentration of barges and other types of flat-bottomed boats suitable for landing troops and the practice in their use were well known to the secret service and must have been observed by the R.A.F. But the Brit. Gov. failed to draw the right inference and evidently imagined that the boats were intended for the purpose of negotiating the flooded areas of Holland. Even at the eleventh hour they did not realise that the dispatch of strong Ger. naval units to the N. waters of Norway was a decoy to draw the Brit. fleet away from the Skagerrak where they could have destroyed most of the Ger. transports and accompanying vessels and then sailed N. to destroy the rest of the Ger. naval units. The result of the Ger. success was of course to place the entire Norwegian coast in their hands as a base for future operations against the Brit. Isles. See H. K. Lohmkuhl, *The Invasion of Norway* (pub. by authority of the Norwegian Gov.), 1940, and *Hilter attackt Norway, 1943*; Lord Strabolgi, *Narvik and After, 1940*; and C. J. Hambro, *I saw it Happen in Norway, 1940*.

Norwegian Sea, name given to the part of the N. Atlantic Ocean which stretches between Norway and Greenland, and between the Arctic Ocean and about lat. 61° N. It is connected with the Arctic in the far N. between Svalbard (Spitsbergen) and Greenland, by a wide, deep opening. An extensive seal and whale fishery is carried on, esp. off the N. and E. coasts of Jan Mayen Is. Area 100,000 sq. m. Mean depth 870 fathoms.

Nor'-wester, prevailing wind of S. Is. New Zealand. It causes a heavy rainfall on the W. slopes of the S. Alps, and becomes a warm and dry *fohn* wind over the plains to the E. of the mts.

Norwich, city and co. bor. in the centre of the E. portion of the co. of Norfolk, England, 20 m. from the coast and situated in the valley of the Wensum, about 115 m. N.E. by N. of London. It is accessible from London by the N.E. Region railway and from the Midlands by the Midland Region Railway, and is reached by the R. Yare from the broads of Norfolk and Suffolk. Fragments of the ant. walls, which were 4 m. in circuit, remain. On a mound, which existed before 1100, with pleasure gardens occupying the moat,

stands the famous Norman castle. Built soon after the Conquest to dominate E. Anglia, it was destroyed in the earl of Norfolk's rebellion against William I., and the present building, an almost cubic block, is attributed to Wm. Fitz-Osbern. It suffered capture by Flemings in 1174 and by Fr. troops in the reign of King John, but its military importance declined with the coming of artillery and the gradual settlement of the country. It was given to the co. by George III. and was used as a jail until 1887, when the prison on Moushold was built. Refaced in 1834-39, the keep was opened in 1894 as the Norwich Castle Museum, where are to be found important collections of antiquities, paintings by artists of the 'Norwich School,' water-colours bequeathed by J. J. Colman in 1942, raptorial birds and flint implements. The cathedral was founded by Bishop Hubert de Losinga in 1096. Fire claimed a large part of the building in, the thirteenth century; the present structure is composite but mainly Norman. The exceptionally long nave of 401 ft. has a fine vaulted roof with 328 sculptured bosses and lofty triforium arches. The apse is Norman, the only other being at Peterborough. At the E. end is a unique original bishop's throne in stone. The Late Perpendicular spire (312 ft.) is of the fifteenth century and is the second highest in England (Salisbury being 404 ft.). There are two original Norman chapels at the E. end. The finely vaulted quadrangular cloisters (1297-1430), enriched with carved bosses, have been recently restored. The oak choir stalls, sixty-two in number, are beautifully carved and date from the fifteenth century. The tomb of Edith Cavell lies on the S. side of the cathedral in the part known as 'Life's Green,' and her memorial stands on Tombland.

There are over thirty city churches, mostly built of flint in Late Decorated or Perpendicular style. The largest, St. Peter Mancroft, dating from 1430 to 1455, is one of the finest par. churches in England; its tower is 102 ft. and the church contains the tomb of Sir Thomas Browne, whose statue stands on the Haymarket near by. St. Andrew's Church, rebuilt 1506, contains elaborate tombs of the Suckling family and a memorial tablet to 'Abraham Lincoln' of great interest to Ainer. The fifteenth-century church of St. Peter Hungate is now an eccles. museum. Air raids in the war cost the city sev. churches, including that of St. Julian, associated with Dame Juliana, said to be the first woman writer in the Eng. tongue. The grammar school, originally a charnel-house chapel of c. 1315, was converted into a grammar school in the reign of Edward VI. Lord Nelson, George Borrow, and Rajah Brooke of Sarawak were scholars there. The guildhall (1407-13), a quaint flint building, housed, until the opening of the new city hall, a superb collection of civic plate. The city hall, opened in 1938 by the king and queen, is typical of modern civic architecture. Historical and industrial plaques on the entrance doors are note-

worthy and the clock tower is 185 ft. high. The garden of remembrance was designed by Lutyens and involved the destruction of many period buildings over a wide area; some, however, including the church of St. Peter Mancroft, the guildhall, and Queen Anne buildings, remain. The fifteenth-century St. Andrew's Hall was at one time the nave of the church of the Dominicans or Blackfriars. Other notable features are the fifteenth-century Maid's Head Hotel; Suckling House, sixteenth-century banqueting hall; Erpingham Gate, built by Sir Thomas Erpingham, 1420; Ethelbert Gate, commemorating a riot between monks and citizens, 1272; the Bridewell, built 1370, now a museum of local industries; Pull's Ferry, anct. water-gate; and the thirteenth-century Bishop's Bridge, one of the oldest bridges in England. The chief parks are Eaton Park and Earham Park. Other parks and open spaces include Household Heath, Chapel-field Garden (the central public garden of Norwich), Waterloo Park, and the quaint, cobbled and gabled 'Tombland' which derives its name from the tomb or wasteland of the old Franciscan monastery. Theatres include the Maddermarket, home of the Norwich Players, and the Theatre Royal.

The staple industry of Norwich, employing over 10,000 hands, is that of higher grade shoes. Other large industries include those of mustard, starch, cereals, confectionery, electrical engineering, brewing, silk and silk dyeing, and weaving. For centuries Norwich has been the leading mfrkt. tn. in E. Anglia. There are large cattle, provision, and fish markets. The Norwich provision market is of very anct. origin.

Norwich is administered by a mayor, sixteen aldermen, and forty-eight councillors, and returns two members to Parliament.

Norwich had no widespread central devastated area as a result of the enemy air raids, but in few places outside London was there such considerable damage scattered over the city as a whole. During 1940-43 some 340 persons were killed and nearly 1100 injured. Some 2082 dwelling houses were destroyed and 2651 seriously damaged. Norwich was the victim of the so-called 'Baedeker' raids on April 27-28, 1942. Many historical monuments were damaged or destroyed; the cathedral and castle, however, suffered little serious damage. Pop. (estimated 1946) 114,730. There is a long hist. of Norwich in the Norfolk Directory, c. 1862. See also J. Sillett, *Collection of Views of Churches, etc.*, 1828; W. Bye, *Norwich Castle*, 1921; R. H. Mottram, *Assault Upon Norwich* (the official account of the air raids on the city, 1944); and A. Kent, *Norwich Inheritance* (photographs), 1948.

Norwich: 1. City of Connecticut, U.S.A., on the R. Thames, 40 m. S.E. of Hartford. It is a flourishing industrial centre, manufs. woollens, razors, velvet and cotton goods, and cutlery. It was settled in 1659, when 9 sq. m. were bought of Uncas, an Indian chief, for the equivalent of £70. Pop. 23,600. 2. Cap. of Chenango co., New

York, U.S.A., on the Chenango R., 50 m. S.E. of Syracuse. Pop. 8600.

Norwood, Sir Cyril (b. 1875), Eng. educationist, son of a clergyman, was educated at Merchant Taylors' and at St. John's College, Oxford, of which college he was president from 1934 to 1946. He secured the first place in the civil service examination for first-class clerks and for two years served in the Admiralty. At twenty-six he left the service to become a master at Leeds Grammar School. In 1906 he was elected headmaster of Bristol Grammar School and ten years later he went to Marlborough College, where he introduced some rather drastic reforms (1916-25). In 1920 he became headmaster of Harrow. He made a name by the reforms he introduced into the different schools under his care and has written on educational subjects. He was knighted in 1938.

Norwood, Frederick William, Brit. preacher, b. in Australia and educated at Ormond College, Melbourne. D.D., Oberlin College, Ohio. After holding livings at Canterbury, Victoria, and N. Adelaide, he was appointed minister of the City Temple, London, 1919, and remained there until 1936. He was minister in Vancouver from 1939 to 1943 and then at St. James's Church, Montreal. He continued to live in Canada after his retirement, which he spends in literature, lecturing, and special preaching. Among his books the best known are *Indiscretions of a Preacher* (1932) and *Preaching in our Generation* (1942).

Norwood, Gilbert (b. 1880), Eng. classical scholar. He was prof. of Gk. at Cardiff from 1908 to 1926 and then went to Toronto Univ. as prof. of classics. His pubs. include *Greek Tragedy* (1920); *Writings of Greece* (1925); *Greek Comedy* (1931); and *Pindar* (1945).

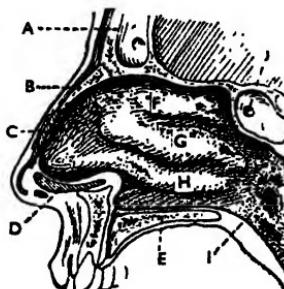
Norwood, Richard (1590?-1675), Eng. mathematician. In 1616 he was sent to the Bermudas to survey the newly settled is., and was accused of having reserved for himself some of the best land there; he certainly resided there during the civil war, carrying on his profession of teacher of mathematics. His pub. a map of Bermudas in 1622; *The Gunner, shewing the whole Practice of Artillerie* (1628); *Trigonometric, Or the Doctrine of Triangles* (1631); *The Seaman's Practice* (1637); and *The Doctrine of Triangles* (1667).

Norwood: 1. Suburban dist. of S. London, a mile S.W. of Dulwich. It consists of Upper, Lower, and S. N., and forms the S. portion of the bor. of Lambeth. Pop. 85,800. 2. Tn. of Adelaide co., S. Australia, forming a suburb 3 m. N.E. of Adelaide. There are market gardens, and brewing is carried on. Pop. 16,000. 3. Tn. of Ohio, U.S.A., in Hamilton co., forming a S.W. suburb of Cincinnati. It manufs. playing cards, office furniture, safes, electrical goods, etc. Pop. 34,000. 4. Tn. of Massachusetts, U.S.A., in Norfolk co., 14 m. S.S.W. of Boston. N. has manufs. of printing materials and binding plants. Pop. 15,300.

Nosari, Nausari, or Navasori, tn. of

Bombay, India, on the l. b. of the Purna R. (which is navigable up to here), and 19 m. S.E. of Surat. It has a colony of Parsee cotton weavers. Pop. 16,500.

Nose, organ of smell. It consists of an external portion and an internal part divided into two nasal cavities. The outer N. has the shape of a triangular pyramid. The bony structure of the N. consists of the short nasal bone which is connected with the forehead by a bridge. Besides this bone, the N. is supported by cartilages, of which the five chief are the cartilage of the septum and the upper and lower lateral cartilages. The cartilage of the septum forms the supporting part of the vertical partition which separates the right and left nasal cavities. The lower part of the septum is not formed



SECTION OF THE NASAL REGION
SHOWING THE RIGHT NASAL
CAVITY

A, frontal bone; B, nasal bone; C,D, nasal cartilages; E, nasal palate; F, superior ethmoidal concha; G, inferior ethmoidal concha; H, inferior turbinal (maxillary concha); I, opening of Eustachian tube; J, opening to sphenoidal sinus.

by the cartilage of the septum, but is freely movable, and is on this account called the *septum mobile nasi*. The upper lateral cartilage is triangular in shape, and serves as a continuation of the nasal bone. It is joined at its lower edge on each side by fibrous tissue to the lower lateral cartilage. This consists of two plates: the outer one is oval and communicates with the inner one by a rounded piece which forms the point of the N. The lowest part of the N., or 'wing,' is formed of skin externally and internally. The orifices or nostrils are guarded by small hairs, or vibrissae, which serve to protect the nasal cavities from dust, small insects, etc. Above the aperture in each nostril is a slightly expanded cavity, the *vestibule*, which is prolonged towards the tip as a pouch, or *ventricle*. Above the vestibule the nasal passage, or *fossa*, is divided into two parts, the upper or *olfactory*, and the lower or *respiratory*, portion. The fossae are divided into three passages or *meatuses* by three *turbinal*, or scroll-like, bones. The meatuses communicate with the ethmoidal, sphenoidal, and frontal cells.

The olfactory region is lined with mucous membrane, yellowish in colour, and containing olfactory glands, or glands of Bowman, embedded in it. In the respiratory region the mucous membrane is covered by columnar, ciliated epithelium, and contains many cells secreting a watery fluid. The N. is supplied by branches of the facial nerve, the ophthalmic, and others for the conveyance of motor impulses and of ordinary tactile sensations. The sense of smell is conveyed by olfactory nerves arising from the olfactory bulb and distributed over the mucous membrane of the olfactory region. Here they are connected with rod-like cells; these cells pass between the columnar epithelium to the surface, where a delicate filament serves as a free end; at the other end of each cell the filament becomes continuous with an olfactory nerve filament. It is not definitely known whether the external stimulus which gives rise to the sensation of smell is physical or chemical in its nature. In 1918 Prof. W. R. Miles of Yale Univ., after experiments with insects, put forward the theory that the sensation is due to infra-red radiations which the nose is able to receive. The substance exciting the smell must be in a finely divided state, and is usually a vapour or gas. The free ends of the olfactory filaments are usually covered with a thin layer of fluid. If the fluid is too thick, as in catarrh, or if it is replaced by a dry crust, the efficiency of the olfactory organ is diminished or temporarily destroyed. The exciting substance becomes dissolved in the watery fluid, and so affects the cell filaments. In order that solution may be effected readily, a certain amount of pressure is necessary; that is, the air containing the substance must be driven with some force against the membrane by sniffing. The organ of smell is probably not so delicately differentiated in man as in some of the lower animals. The sense is quickly fatigued, so that a delicate odour is sometimes not perceived after the initial experience; most persons also find it difficult to discriminate in a mixture of smells, and probably only the predominating odours in a host of smells are perceptible to man, although the lower animals might be able to discern many.

Diseases, etc.—The N. may be fractured by direct violence, and if adequate treatment is not resorted to, a displacement of the septum may result, leading to nasal obstruction and possible complications. *Acne rosacea* is a skin affection characterised by congestion of the capillaries of the outer N. and later by hypertrophy of the sebaceous follicles. The N. has then a swollen appearance, and the course of the dilated capillaries can be plainly seen. It occurs in dyspeptics, alcohol- and tea-drinkers, and is known as 'brandy nose' or 'whisky nose,' though the cause may not be the use of alcohol. Sulphur ointment is useful as a local application, but the condition is only cured by the removal of the predisposing cause. Lupus and erysipelas are also likely to affect the N. Rhinitis is a very common complaint. It

involves inflammation of the mucous membrane of the N.; its acute form is coryza or cold in the head. Chronic rhinitis is due to repeated attacks of the acute form, and produces in the early stages hypertrophy of the mucous membrane, and in the later stages atrophy of the mucous membrane, together with the formation of dry crusts, or scabs. Fibrous rhinitis is a rare form, in which a false membrane is developed in the N. Epistaxis is bleeding from the N. The cause may be a high arterial pressure due to one of a variety of conditions, and in many cases is itself a remedial effort of the organism. Where the bleeding continues the patient should rest quietly on the back, and tannic-gallic acid should be applied locally. If the hemorrhage resists these measures, the N. must be plugged. Polyp, or tumours, may be formed on the mucous membrane. A soft mucous polypus can easily be removed and does not usually recur, but fibrous polypi have a tendency towards malignancy. Sinusitis, or inflammation of the chambers of the skull which open from the N., is of common occurrence.

Nosean, or Noselite, aluminosilicate and sulphate of sodium ($3\text{Na}_2\text{Si}_2\text{Al}_2\text{O}_5\text{Na}_2\text{SO}_4$) closely allied to haunynite (*q.v.*) and the artificial ultramarines. It occurs in cubic crystals, usually dodecahedrons, of various colours and sometimes opaque. Found in the Laacher See (Rhineland), the Albau Mts. (Rome), Kaiserstuhl (Baden), and in several of the haunynite localities.

Noske, Gustav (1863-1946), Ger. politician, b. at Brandenburg, served an apprenticeship as a carpenter but soon took up political journalism and in 1906 entered the Reichstag. In the First World War, which split the Ger. Socialists, N. sided with the majority Socialists under Scheidemann and Ebert. He was governor of Kiel, Oct.-Dec. 1918. On the proclamation of the republic there ensued a struggle between the majority Socialists who favoured a democratic regime, and the Spartacist extremists. N. eventually succeeded in suppressing the Spartacist revolt notwithstanding the fact that the rebels were numerous and well armed. Following the defeat of the Spartacists in Berlin by N.'s composite force under Gen. Luttwitz (Jan. 1, 1919) N. was appointed minister of defence in the Coalition Gov. of the Weimar Republic (Feb. 6, 1919). He was now the strongest man in Germany and a great asset to the Weimar Gov. because he attracted to it Conservatives who would otherwise have remained hostile. In this, however, he dug his own political grave, by misplaced confidence in certain reactionary elements, and in the result the threats from the right over the Versailles Treaty culminated in the Kapp *putsch* (March 1920) and the Weimar Gov. fled from Berlin for a brief interval. After Kapp had been starved into surrender, the gov. returned but was later involved in conflict with a newly formed Red Army in the Ruhr. N. marched gov. troops to the disaffected area, but being in the neutral zone he provoked the occupation

by the Fr. of Frankfurt and other tns., and as a sequel to these events, which profoundly shocked Germany, N., already discredited by the consequences of his encouragement of old army influences, had to resign. Later he became president of the prov. of Hanover. N. was arrested by the Nazis after the bomb plot against Hitler in July 1944 and sent to a concentration camp but later moved to the Moabit prison where he was found when the war ended. He pub. *Kolonialpolitik und Sozialdemokratie* (1914) and *Von Kiel bis Kapp*, 1920.

Nosology (Gk. *víros*, disease; *λόγος*, science), that branch of medicine which treats of the distribution and arrangement of diseases into classes, orders, etc. The most popular system is that of Dr. Farr (1837) which has taken the place of Cullen's. The term is also applied to collection of evidence as to whether a particular condition should be regarded as a special disease.

Nossairians, or Alawis, see ANSARS.

Nossi-Bé, ls. 8 m. from the N.W. coast of Madagascar, belonging to France. It is 14 m. long by 10 m. broad with an area of 130 sq. m. It is volcanic and mountainous. Rice, maize, manioc, bananas, coffee, and sugar are grown. Cap. Hellville. Pop. 12,000.

Nostalgia (Gk. *vóteros*, return home; *ἄγον* pain), home-sickness. It is sometimes an early phase of melancholia, but is usually a psychic manifestation merely. It varies in intensity from a sentimental inclination to think fondly of the homeland to an uncontrollable desire to return and a settled dislike of one's present surroundings. The onset may be gradual, or may be precipitated by any critical or disturbing occurrence. It is very common among people who have previously dwelt in agric. and pastoral dists. where the inhab. are inclined to be chauvinistic and intolerant of innovations. The cause of the condition is undoubtedly the realisation of the change of circumstances, and the absence of familiar people and impressions. That there is no organic lesion in this form of melancholia is attested by the fact that the condition immediately disappears when the desire to return has been accomplished.

Nostradamus, or Michel de Notre-Dame (1503-66), Fr. astrologer, of Jewish extraction, b. at St. Rémy, Provence. For many years he practised as a physician, and gained high reputation for his skill in stemming the tide of the great plagues of Lyons. Catherine de' Medici brought him to her court, and he was physician to Charles IX. His *Centuries*, prophecies in rhymed quatrains, was pub. in 1555. and aroused universal interest and excitement. See lives by E. Joubert, 1856; E. Baroche, 1840; and C. Wollner, *Das Mysterium des Nostradamus*, 1926.

Nota, Alberto (1775-1847). It. comedy writer, b. at Turin. He was greatly influenced by Molière, but he followed his model too closely to give his own individuality scope and freedom. His best work is perhaps *La Lusinghiera*. Collected eds. of his plays were pub. at

Florence in 1827 and at Turin in 1837 and 1842.

Notables, The, advisory assemblies of notable personages summoned by the kings of France in times of stress. These assemblies had no constitutional authority whatever, and their transactions were of a purely private and confidential nature. Richelieu consulted this body in preference to the states-general. The best known was that convoked by Louis XVI. in 1787 at the instigation of Colonne; it was called in order that the privileged classes might be prepared for, and give their consent to, a more equitable system of tax collecting. Louis XVI. again summoned the N. in 1788.

Notary Public. The office of N. P. is of great antiquity, and its origin is to be traced to the professional writers or scribes who made drafts of public and private instruments. According to Brooke (*Treatise on Notaries*, 1901) the name was applied amongst the Jews to the royal secretaries who wrote the letters and edicts of the king, kept the register of his troops, and attended to his revenue and expenditure; to scribes who copied and interpreted sacred writings, and to officials who wrote and prepared legal documents. The same authority finds analogous offices in ant. Syracuse, Egypt, Greece, and Rome. The term *notary* itself is derived from Lat. *nota*, meaning the system of stenography in vogue among the early Rom. scribes, though later it appears to have been applied to the clerks or registrars attached to the prov. and municipal magistrates and officials of the emperor's privy council, while those who prepared private deeds and documents were specifically known as *tabelliones* from *tabellio*, the thin waxed tablets used in drafting. There is no European nation without its Ns. P., though their duties differ considerably in different countries. In England the duties of a N. P. are very circumscribed, and in status he is far below, for example, the N. P. of France. The Eng. notary's chief duties are to note and protest bills of exchange, to authenticate copies of private documents and deeds, to draft and attest instruments like powers of attorney about to be sent abroad, and receive affidavits of mariners, and administer oaths. A great many of the functions of a notary are, however, in England performed by solicitors, e.g. the preparation of wills and contracts, and hence it is that this official's duties are so commonly associated with protesting bills of exchange on dishonour. The utility of 'a notarial act' (i.e. the act of authenticating or certifying a document or entry by a written instrument under the signature and seal of a N. P., or an instrument attestation, or certificate made or signed by a N. P.) is that it is by the custom of all merchants accepted as unimpeachable evidence of the legal validity of the transaction recorded by it, notwithstanding that such transaction may have no validity in the country where it actually took place. The powers of a N. P. in America are wider; they may take depositions and do other acts relating to

the recording of testimony, and take proofs of debts in bankruptcy. In England Ns. P. who have always been civil and canon law officials are appointed by the archbishop of Canterbury. In America, they are appointed by the state-governor, and with the advice of either the council or the senate of the state.

Notation (Lat. *notatio, nota*, to mark), in music, the art of writing music in notes, i.e. representing musical sounds and their various modifications, by notes, signs, etc. From 990 to 1050 N. was much improved by Guido of Arezzo, who founded our present system. The anct. Gk. system was phonetic; also the modern Arabian system, the old tablatures, and Tonic Sol-fa methods of to-day. Sound, key distance, and scale relationship are their bases. The diastematic system of 'N. by intervals' comprised the neums (or neumes), representing groups of notes, and first came into use about the seventh century. The neums are still to be found in the plainsong manuals of the chord. The pitch of sound is now expressed by the positions of notes and the presence of clefs on sets of five lines, called 'staves' (which began as a single line and afterwards had companion lines added to it). Their relative duration is defined by variously shaped notes. Key and rhythm are indicated by signatures. Present N. is somewhat inadequate to the demands of modern music, because atonal writing involves frequent accidentals. Various new systems have been suggested, but the obstacle to reform is the vast mass of printed music.

In mathematics N. is the elaborate system of signs, symbols, numbers, and letters which has been evolved gradually to meet the needs of discovery. There is no accepted world system of N., but there is enough uniformity to enable mathematicians in different countries to understand each other. N. is of fundamental importance to mathematics, as language is to philosophy, and the progress made would have been impossible by the use of words alone. For a full treatment see F. Cajori, *A History of Mathematical Notation*, 1928.

Scales of N. are the various systems of writing numbers, the common and only one in practical use to-day being the denary scale or scale of ten, ten being the radix. On this scale 12 means $10 + 2$. There can be binary, tertiary, etc., scales with radices of 2, 3, etc. On the nonary scale, for example, where the radix is 9, 12 means $9 + 2$, which would be written 11 in the ordinary scale. Each branch of science has its own particular system of N., based on mathematical N. and adapted for special needs, see CHEMISTRY, PHYSICS, etc. See also DECIMAL SYSTEM; SIGNS; SYMBOLS.

Notched-Bar Test, method of testing relatively ductile materials. A notched metal bar is struck by a heavy pendulum, the energy required to break the bar being expressed in foot-pounds.

'Notes and Queries', weekly paper of quaint or unknown or little-known facts, phrases, archaisms, and bibliographies of interest to the literary world, estab. in

1849 by the antiquary, Wm. John Thoms, with the object of 'providing a paper in which literary men could answer one another's questions.' A full account of the hist. of *N. and Q.* from the pen of Thoms will be found in some of the 1876 and 1877 numbers. Thoms was himself a great contributor to the paper, some of his most arresting articles being, 'The Death Warrant of Charles I.', another 'Historic Doubt,' 'Lord Chatham and the Princess Olive,' and 'Hannah Lightfoot.' Its motto was, until 1923, Capt. Cuttle's, 'When found, make a note of.' In 1920 it was bought by *The Times*, and in 1939 by the Oxford Univ. Press.

Notes, Bank, see BANKS AND BANKING.

Nothochloëns, genus of ferns of delicate appearance, the fronds being green on the upper surface and powdery or scaly white underneath. A number of species are grown in stovehouses and greenhouses.

Nothoscordum, genus of bulbous plants (family Liliaceae) bearing umbels of white, yellow, lilac, rose, or purple flowers. *N. fragrans* and a few other species are hardy; others are grown in cool greenhouses.

Nothotherium, see SLOTH.

Notice, Equitable and Judicial: *Equitable*.—It is a principle of equity (q.v.) that an equitable as distinct from a legal (i.e. common law) interest in property is in no way binding upon the person who obtains the legal interest, unless he ought in conscience to respect the equitable interest, and in general his conscience can only be affected by *notice*, actual or constructive, of the existence of the equitable interest; e.g. A, the owner of an estate, creates an equitable mortgage of it to B; then without disclosing such mortgage, A makes another equitable mortgage of it to C. C is ordinarily postponed to B in the matter of repayment of their loans because later in point of time; but if, assuming that at the time he took his mortgage he had no notice of the existence of the mortgage to B, he subsequently induces A to convey to him the legal estate whether by way of mortgage or otherwise, he can ignore B's mortgage altogether. By constructive notice is meant either knowledge of a fact from which the existence of an equitable interest ought to have been inferred, or the possibility of discovering its existence by the usual method of investigating title.

Judicial.—A court of law is said to take judicial notice of a fact when it accepts it in evidence without proof. All judges take judicial notice of *inter alia*: (1) All Acts of Parliament, public or private, and all unwritten laws and legal principles acted upon by the courts of Great Britain; (2) all general customs decided by a superior court of law of equity to have the force of law; (3) the course of proceeding, and all rules of practice of the Supreme Court; (4) the general course of proceeding and privileges of Parliament; (5) the ordinary course of nature, and natural and artificial divs. of time; (6) the ordinary meaning of Eng. words; (7) the existence of every state and sovereign recognised by this country; (8) the signatures of high court judges; and (9) all matters which they are directed by statute to notice.

See Taylor, On Evidence, and Stephen, Digest of Evidence.

Notker, or Balbulus (the Stammerer) (c. 840-912), Swiss monk, b. in E. Switzerland. He was a musician at the monastery of St. Gall. He wrote on musical notation, the organ, and the perfection of plainsong, and as a composer contributed to the development of liturgical sequences. See S. Singer, *Die Dichterschule von St. Gallen*, 1922.

Notification of Diseases. It is compulsory in Great Britain, under the Infectious Diseases Acts of 1889 and 1899, to notify the local medical officer of health of cases of certain infectious diseases, such as diphtheria, scarlet fever, typhoid fever, etc., so that effective steps may be taken to prevent, by isolation, etc., any spread of the disease. The duty of giving notification falls upon the head of the family, but it is usually performed by the doctor attending the case. Failure to notify involves a penalty of 40s. Certain other diseases, such as chicken-pox, cerebro-spinal fever, etc., may be made compulsorily notifiable in special areas by order of the local authorities.

Noto, tn. in the prov. of Syracuse, Sicily, 2 m. inland. There are Christian catacombs, Gk. cemeteries, and prehistoric tombs. A mediæval tn. occupied the site of Netum, a Scel city, 5 m. to the N., but was overwhelmed in an earthquake. The present tn. was constructed ten years later in 1703. There is trade in wine, oil, and corn. Pop. 33,800.

Notochord, supporting rod of closely packed cells characteristic of those animals which comprise the phylum *Chordata*. The N. runs lengthwise from anterior to posterior ends, and is situated immediately ventral to the spinal cord. The members of the sub-phylum *Acrania* lack a skull and backbone; they comprise (1) the Cephalochordata, such as *Amphioxus* (*a.v.*) which are named from the extension of the N. to the extreme tip of the 'head,' (2) the Tunicates or Sea Squirts, which possess a N. in the larval stage, though it is lost in the adult, (3) the Hemichordata, e.g. *Balanoglossus*, worm-like animals with the N. restricted to the region of the proboscis. In the remaining sub-phylum, *Cranialia* or *Vertebrata* (fishes, amphibians, reptiles, birds, and mammals), a skull with a cranium enclosing the brain is formed, and the N. becomes surrounded by the vertebrae of the backbone. In some lower forms of vertebrates, such as the lamprey, the N. persists in the adult, but in most it can be recognised only in the embryo, and is soon obliterated by the backbone which develops around it.

Notornis, see TAKANE.

Notre, André Le, see LE NOTRE.

Notre Dame Bay lies between Fogo Is. and Cape St. John' on the N. coast of Newfoundland in the bay of Exploits; at the E. end is a large archipelago.

Notre-Dame de Paris (Our Lady of Paris), most important cathedral of Paris. Construction was begun in 1163, on the site of an anc. Merovingian cathedral, and continued until 1245, when the general scheme was completed. There was an

overall restoration in 1845-64 under the direction of Viollet-le-Duc. It is a fine example of the two first periods of Gothic, the great rose-window, the apse, the towers, and the doors being especially noteworthy, and possesses the Crown of Thorns and a fragment of the Cross. The fountain of Notre-Dame is situated in the square of the archbishopric, which occupies the site of the old palace, sacked in 1311. It was built in 1842-46 by Vigouroux, in the Gothic style. *See M. Aubert, Notre-Dame de Paris*, 1928.

Nottingham, Earls of, see FINCH, HENLAGE, and HOWARD OF EFFINGHAM.

Nottingham, city and co. bor. of England, cap. of Nottinghamshire, on the Trent, 125 m. N.N.W. of London by rail, and an important rail centre. The R. Trent is navigable to the sea, and gives access to Newark, Gainsborough, and the Humber ports. At the Nottingham end of the navigation there are adequate basins, warehouses, and transport sheds. The prin. industries include the manuf. of lace, hosiery, chemicals, mechanical products, tobacco, cycles, and general engineering works. Other important industries are bleaching, dyeing, spinning, tanning, brewing, and furniture. The water supply, health services, gas, public lighting, and transport undertakings are all owned and controlled by the municipality. The amenities of the city include numerous public baths, libraries, and parks, an art gallery, and two museums. Over 20,000 houses have been built by the N. Corporation and it is estimated that a further 20,000 will be required during the next twenty years. There is a central retail market, a wholesale market, a cattle market, and a public abattoir, all municipally owned. The famous N. Goose Fair is held in Oct. each year.

The prin. public buildings are the Council House, opened in 1929 by the Prince of Wales, the guildhall, and N. Castle, originally built on Castle Rock by William the Conqueror, dismantled during the Protectorate, restored in 1878, and now the Castle Museum and Art Gallery. The collections include examples of N. alabaster carving, a local industry of the fourteenth and fifteenth centuries. Other important buildings are the churches of St. Mary (fifteenth century), St. Peter (partly twelfth and partly fifteenth century), St. Nicholas (1678), and the Rom. Catholic cathedral of St. Barnabas (designed by Pugin), and the Shire Hall, Albert Hall, etc.

Facilities for educational advancement in the city are on a wide and generous scale, extending from nursery schools to a fine univ. The education authority is responsible for primary, secondary, and grammar school education, and development is taking place to provide all forms of educational activity as envisaged by national legislation. In the sphere of further education, a college of art and crafts, a technical college, and many evening institutes have been provided. There are two high schools, namely, the boys' and the girls'. Ancillary services

provided by the Education Committee include the school health service, school clinics, a child guidance clinic, open-air schools, and a school meals service. The N. Playhouse Theatre, a non-profit-making venture, was begun in Nov. 1948 and is run by a trust representing the various interests of city and univ. N. Univ. (g.v.) is housed in a beautiful new building erected by Sir Jesse Boot, later the first Lord Trent, in a park on the outskirts of the city in a setting of exceptional beauty, and was opened by George V. in 1928. The park adjoining the college is 220 ac. in extent.

Within a few minutes from the centre of the city is Wollaton Park (744 ac. in extent) with its magnificent Elizabethan hall, now a natural hist. museum. There are many fine parks and recreation grounds catering for all types of sport and recreation. Newstead Abbey, the home of Lord Byron, the poet, and of great historical interest, came into the possession of the corporation in 1931, the ceremony of handing over the property being performed by M. Venizelos, then Prime Minister of Greece. The abbey contains many fine Byron relics.

The Rom. station of Margidunum at E. Bridgford was an important site on the Rom. Fosse Way between Leicester and Lincoln. A fort of Claudian age has been very thoroughly excavated in recent years. The A.-S. named the tn. Snotengaham and occupied it for a long period from about the sixth century A.D. N. was one of the 'Five Burghs' occupied by the Danes. William the Conqueror occupied the tn. in 1066. In 1589 the Rev. Wm. Lee invented the first stocking frame here. At N. Richard Arkwright first erected his spinning frames and Hargreaves his spinning jenny. Charles I. raised his standard here in 1642 and the next year the tn. and castle were taken by the Parliamentarians. Serious riots, occasioned by the introduction of machinery, took place in 1811-12 and 1816-17. Sherwood Forest (the legendary home of Robin Hood) has long been shorn of its mighty grandeur, but remains of it still exist in the Dukeries in the N. part of the co.

The city, which has four members of Parliament, is governed by the city council, consisting of sixty-four elected members. There is a lord mayor, a sheriff, sixteen aldermen, and forty-eight councillors. Pop. 285,000. See D. Gray, *Nottingham Through Five Hundred Years: a Short History of Town Government*, 1949.

Nottinghamshire (Notts), midland co. of England. The surface varies, part of it being a continuation of the Yorkshire plain, rising towards the S.W., where the Robin Hood Hills reach an elevation of over 800 ft. Near to these hills lies Sherwood Forest, famous for its connection with Robin Hood, and now mostly included in the Dukeries that form what is known as the Dukeries. The prin. rívs. are the Trent, Ercwash, Soar, and Idle. The Fosse Dyke and Nottingham and Grantham canals connect the Trent and the Witham. On the W. border lie the

Cresswell Crags, in which are some famous caves, where remains of mammoth, cave lion, etc., have been found. On the S.W. there are extensive coal-mines, Nottingham and Mansfield being the chief centres. Sandstone, limestone, and clay are worked. The prin. manufs. are lace and hosiery; there are also silk, worsted, woollen- and cotton-mills, iron foundries, and cycle works, and at Beeston machinery and motor works, while there are tobacco factories at Nottingham. The greater part of the co. is under cultivation, and there are numerous hop gardens. Agriculture and farming flourish in the N.E. and S.E. and there are large apple and pear orchards. It is divided into five parl. divs., each returning one member. In anot. times it formed part of the kingdom of Mercia, and was subjected to many incursions from the Danes. At the time of the dissolution of the monasteries there were forty religious houses in N., but the only important remains are those of Newstead Abbey. There are some fine churches, including Southwell Cathedral of Norman date and some splendid modern mansions in the Dukeries. Area 827 sq. m. Pop. 719,200. See Victoria County History, *Nottinghamshire*; also White, *History, Directory and Gazetteer of Nottingham*, 1853, and A. C. Wood, *A History of Nottinghamshire*, 1947.

Nottinghamshire and Derbyshire Regiment, see SHERWOOD FORESTERS.

Nottingham University, at Highfields, 2½ m. from the centre of Nottingham, England, is on an ideal site in open country. It is a development of the former Univ. College, which owed its origin to civic enterprise and was opened in 1881. In 1903 the college received its royal charter of incorporation, and in 1920 it estab. the first fully constituted dept. of adult education in the country. The foundations for an independent univ. for Nottingham were laid by Jesse Boot, first Lord Trent, the Nottingham industrialist, who spent about £1,000,000 on the univ. park and buildings and thereby ensured the ultimate success of Univ. College. It developed rapidly, and in 1938 received a supplementary charter which greatly improved its constitution and paved the way to full univ. status. In July 1948 a royal charter was granted to the college, which thus became the twelfth independent Eng. univ. to achieve full univ. status. Developments since 1945 have included the creation of chairs of law and philosophy, a readership in theology, the transfer to the univ. of the Midland Agric. College as its school of agriculture, and the foundation of the institute of education. In 1949 N. Univ. had 2189 students, the ann. intake being about 650. On May 3, 1939, the second Lord Trent was installed as the first chancellor of the univ.

By the good fortune of its site Nottingham is able to set its main univ. buildings and residential halls in one place together, instead of having them scattered about the city. It is planned to make the univ. wholly residential for 3000 students by building nine new halls and generally to

develop the univ. into a true academic community with a life and spirit of its own. The Senate House and main univ. building was finely placed by Morley Horder on the upper slopes of a broad-backed ridge overlooking the ornamental lake of Wollaton Park. It was built to provide for the main needs, other than residential, of a univ. college of 500. Two halls of residence, Hugh Stewart Hall and Florence Boot Hall, were built for men and women students respectively. The problem of the univ. authorities is how to provide for all the needs of a great modern univ. without destroying the amenities and park-like character of its original setting. With the present main building, or Senate House as its pivot, the lay-out of the univ. council's development plan provides for a univ. campus stretching across the crown of the ridge. The new main buildings are to be grouped around this centre and erected on three sides of a large quadrangle opening on to the Senate House. These buildings would include the library, the great hall, lecture rooms, and the schools of music and fine art. The union house, which is to be the social centre of the univ., is to be erected adjacent and to the E. of the Senate House. The science dept. and the proposed institute of physical education are placed on the E. side of the univ. site, while the chapel will be built to the W. of the Senate House. This master plan has been framed to provide for the growth of an integrated univ., with its central buildings harmoniously grouped to provide for teaching, administration, research, and social amenities, and its residential colleges planted in beautiful surroundings in the vicinity. For the full realisation of the plan a site of not less than 340 ac. is required. The univ. owns or leases at present 170 ac. and there is unspoilt parkland surrounding the present site to provide amply for future needs.

Notting Hill, dist. of London, England, near the W. end of Hyde Park, 4 m. W. of St. Paul's, part of the bor. of Kensington. It is a favourite residential dist.

Notus (Gk. name for the S. or S.W. wind), *see AUSTER*.

Nouméa, or **Numéa**, also called **Port-de-France**, cap. of the Fr. colony of New Caledonia, on the bay of N. on the S.W. coast of the is. It has an excellent harbour, a gov. house, museum, college, and barracks. It was an aircraft-carrier base in the Second World War. Pop. 19,100.

Noúmenon (from Gk. νοῦν, to know), in philosophy, a term introduced by Kant (q.v.) and rarely used apart from the consideration of his own philosophy. According to him, noumena are the real objects in themselves lying behind the phenomena, a phenomenon being defined as the 'undetermined object of an empirical intuition.' The noumenal world he held at first to be completely unknowable, since we can only recognise phenomena; but later he teaches that introduction to it is given by the practical reason, the capacity which we exercise as moral agents.

Novae, or **New Stars**, are stars which are

suddenly perceived, after having been previously invisible. The outburst of brilliance is usually temporary. Probably new stars of small brilliancy are of not infrequent occurrence, but of the larger magnitude, such, for instance, as are visible to the naked eye, the number has been few. One such was observed by Hipparchus, the father of astronomy. Tycho Brahe observed the brightest recorded nova on Nov. 6, 1572, in the constellation of Cassiopeia, and in Oct. 1604 Kepler and Galileo saw one in Ophiuchus. The latter, and one seen in Vulpecula by Antwerp in 1670, were the only N. seen in the seventeenth century; but eight were found in the nineteenth. Since 1900 nearly 100 N. have been discovered, though generally they were invisible to the naked eye. The discovery of N. has been facilitated by the examination of photographic plates. Two of the most important N. in recent years have been Nova Aurigæ (1892) and Nova Persæ (1901), both of which were discovered with the naked eye by Dr. Anderson at Edinburgh. When discovered on the morning of Feb. 22 the magnitude of the latter was 2.8, next day it was ten times as bright, outshining all northern stars, after which it declined till in 1903 it was of the twelfth magnitude. In 1918 Nova Aquilæ achieved a brightness second only to Sirius; in 1912 Nova Puppis reached the first magnitude. It is probable that the outer envelope of the star is blown off by some immense explosion. Occasionally super-N. are discovered. These increase in brightness much more than ordinary N., but are so far away that they are known only by photographic records.

Novaeas, Bartholomeu, *see DÍAZ, BARTHOLOMÉU*.

Novášum, see NEUSS.

Nová-Góa, see GÓA.

Novák, Vítězslav (1870-1949), Czech composer, b. at Kamenice. He was the son of a doctor, but lost his father early and had to support the family by teaching. While studying law at Prague Univ. he attended the Conservatoire, studying the pianoforte with Jiránek and composition with Dvořák, who persuaded him to devote himself wholly to music. He soon made a career as a distinguished teacher of composition, and in 1909 was appointed prof. at the Conservatoire. After the First World War, which regained his country's independence, he became prof. of the 'Master School' and was its director in 1919-22. Works include operas, *The Imp of Zrlikov*, *A Night at Karlstein*, *The Lantern*, *The Grandfather's Will*, and *The Wood Nymph*; ballets, *Signorina Giorenna* and *Nikolina*; cantatas, *The Storm*, *The Spectre's Bride*, and choral ballads; symphonic poems, *In the Tatra*, *Eternal Longing*, *Tonina and the Wood Nymph*, octets *The Corsair* (after Byron), *Maryša*, *Lady Godiva*, instrumental pieces, and songs. *Mansfield* (ballad after Byron), *Songs of Winter Nights* *Pan*, *Eroticon*; song cycles, *Gypsy Songs*, *Melancholy*, *In the Valley of a New Kingdom*, *Melancholy Songs of Love*, *Nocturnes*, *Eroticon*, etc.

Novalis, literary name assumed by

Friedrich von Hardenberg (1772-1801), Ger. poet and philosopher, b. at Oberwiederstedt, Thuringia. In 1789 N. was sent to Jena to study; in 1792 he went with his brother Erasmus to Leipzig Univ., and in the succeeding year to Wittenberg, where he completed his studies. On leaving Wittenberg he went to Arnstadt, where he became enamoured of the fifteen-year-old Sophie von Kuhn. In 1795 N. went to Weissenfels, and was made auditor of the Saxon Salt Works, of which his father was director. The death of Sophie and of his brother Erasmus, both in 1797, was a severe shock to N. *Hymns to the Night* (1800) were written about this time. The tragedy aroused in N. a poetic and mystic strength. Feeling himself ecstastically united with the dead beloved, he tried to free the spirit from material things. Thus originated his system of magic idealism. N., one of the most important of the early romantics, commenced the romance *Heinrich von Oestfrdingen* in 1800, but never completed it. His works were collected and ed. by his friends L. Tieck and F. Schlegel in 1802. Later eds. are those of J. Minor, 1907; P. Kluckhohn (with diaries), 1928; and C. Seelig, 1946. See studies by E. Hellborn, 1901; R. Samuel, 1925; and J. von Minnegorode, 1941.

Novara (anc. Novaria), tn., the cap. of a prov. of the same name in Piedmont, Italy, 27 m. W. of Milan. It has a magnificent cathedral dating from the fifth century, and rebuilt in the eleventh. There are important textile manufs. It was ceded to the house of Savoy in 1735. In 1849 Charles Albert, king of Sardinia, was defeated here by the Austrians, and forced to abdicate. Pop. (tn.) 52,000, com. 62,500.

Nova Scotia (Fr. Acadie), prov. of the dominion of Canada, lying between 43° and 47° N. and 58° 40' and 68° 25' W. It consists of two portions, N. S. proper, a large peninsula, and the is. of Cape Breton (q.r.), separated from it by the Gut of Canso. N. S. proper extends 280 m. N.E. and S.W., or, including Cape Breton Is., 350 m. long from N.E. to S.W. The isthmus of Chignecto, 11½ m. wide, connects it with the prov. of New Brunswick. The Cobequid chain of hills stretches from E. to W. and terminates at Cape Chignecto. The highest point is the Igonish Mt. Beyond the fir-studded cliffs of from 200 to 600 ft., which here and there overhang the coast, lies the fertile valley of the Annapolis. On the Atlantic side of the coast between Cape Canso and Cape Sable is situated the harbour of Halifax. The Pictou harbour is the most important on the N. coast. Minas Bay, an inlet on the E. arm of the bay of Fundy, penetrates some 60 m. inland, and terminates in Cobequid Bay. Sable Is. is the most important is. off the coast of N. S. The prin. riva. are: the Annapolis, Avon, Shubenacadie, the E., Middle, and W. rivas. of Pictou, the Musquodoboit, and the Lahave. The fresh-water lakes are Lake Rossignol, situated in Queen's co., and 20 m. long; Ship Harbour Lake, 15 m. in length; and Grand Lake, both of which

are in Halifax co. The climate of N. S. is more temperate than that of New Brunswick, and the air as a general rule is very wholesome. The pop. is 635,000; area, 21,068 sq. m. The cap. is Halifax (pop. 70,600). Other large tns. are Sydney (28,300); Glace Bay (25,147); Dartmouth (10,847); and Truro (10,300). Indians are scattered throughout the prov. The Nova Scotians are mostly Rom. Catholics, Presbyterians, and Baptists; there are not many Anglicans. The local council consists of a House of Assembly of thirty members, at the head of which is appointed a Lieutenant-governor by the Federal Gov. for a term of five years. Education throughout the prov. is free and compulsory. Chief univs.: King's College, Halifax (Anglican), founded in 1790; Acadia Univ., Wolfville (Baptist), founded in 1839; St. Francis Xavier, Antigonish (Rom. Catholic), founded in 1886; and the Dalhousie Univ., Halifax (undenominational), founded in 1818. An agric. college was founded at Truro (1905).

Agriculture is important, especially poultry raising, dairy farming, and fruit growing, particularly apples. There is much interest being shown in land-breaking and under-drainage, and in pasture improvement by fertilisation. The fisheries are also an important industry in N. S., employing over 18,000 men, and being valued at over \$13,000,000, with an invested capital of over \$15,000,000. No cod fish in the world stands the tropical climate like that cured by Nova Scotian fishermen. Lumbering, the manufacturing of wood-pulp for paper, and mixed farming occupy an important section of the pop. In N. S. the greater part of the forest land, amounting to 15,200 sq. m., has passed into private ownership, but the system of disposal of timber by licences to cut is now being followed. What remains vested in the Crown is administered by the chief forester under the minister of lands and forests. The prin. trees are spruce, fir, pine, birch, hemlock, oak, and maple. The leading manufacturing industries are steel products, pig and rolled iron and ferro-alloys; fish-curing; saw-mills; biscuits and confectionery; dairy produce; railway rolling stock; hosierly; and castings and forgings. Manufacturing is, to a considerable extent, dominated by the steel industry. The gross value of manufacturing products is almost \$200,000,000. The chief mineral product is coal (which was produced as early as the eighteenth century) which is subjected to a royalty of 12½ cents per long ton. There are 1000 sq. m. of known coal-fields. Other minerals are gold, salt, lead, zinc, copper, clay products, manganese, gypsum, and limestone. The ann. value of the mineral production of N. S. is from \$25,000,000 to \$30,000,000. All minerals in N. S. (except limestone, gypsum, and building materials) are the property of the Crown, and are administered by the minister of public works and mines. The Inter-colonial Railway, owned and worked by the dominion gov., is the chief means of communication with the other provs.

forming part of the Canadian National Railroad system. The Canadian Pacific Railway has running powers within a certain part of the prov.

The hist. of N. S. dates from the visit of the Cabots in 1497-98, but not until 1604 was any attempt at colonisation made by Europeans. In that year a number of Fr. colonists estab. themselves here. The settlements formed on the modern sites of Annapolis and St. Croix (New Brunswick) were assailed by the Jesuits in 1613 and by the Eng. colonists of Virginia, both of whom expelled the Fr. The old name of the colony, which was Acadia, was changed for N. S. by Sir Wm. Alexander in 1621, who received a grant of the peninsula from James I., intending to colonise

Ward, *Nova Scotia: The Land of Co-operation*, 1942.

Novatian, priest or presbyter at Rome in the third century. He was converted to Christianity after reaching manhood, and was admitted to holy orders by Fabian. In the discussion about those who had lapsed during the Decian persecution (250-51) N. opposed the policy of leniency adopted by Cornelius, bishop of Rome. N. was in consequence put forward by his followers as an anti-pope. A Rom. synod pronounced him schismatic, and he was excommunicated and d. in prison. His bones were brought to Rome, where he was honoured as a martyr. His influence spread, and Novatianism was estab. in Carthage, Alexandria, Constantinople, and



High Commissioner for Canada

NOVA SCOTIA
A Valley at North River, Cape Breton County.

the whole of it. The Fr. were granted the possession of the colony by the treaty of St. Germain-en-Laye (1632). The Fr. settlers, however, quarrelled among themselves, and Cromwell in 1654 sent a force to occupy the settlement. Charles II., by the treaty of Breda (1667), restored N. S. to the Fr.; but not until Britain took possession of the colony in 1713, according to the treaty of Utrecht, was peace possible among the colonists. In the treaty of Paris (1763) France resigned all claim upon the country, and in 1820 Cape Breton united with N. S. Representative gov. was granted as early as 1758, and a fully responsible legislative assembly was estab. in 1848 through the instrumentality of Joseph Howe. In 1867 the prov. entered the dominion of Canada.

See D. Campbell, *Nova Scotia*, 1873; Sir J. Bourinot, *Builders of Nova Scotia*; T. C. Haliburton, *History of Nova Scotia*; H. S. Philpot, *The Province of Nova Scotia: Resources and Development*, 1930; T. M. Longstreth, *The Sunrise Province of Canada*, 1935; G. Patterson, *Studies in Nova Scotian History*, 1940; and L. R.

in Asia until the seventh century. His followers claimed to be especially pure, and adopted the name of Cathari. In their doctrine they denied the power of the Church to absolve from mortal sin, and excluded all convicted sinners from the communion of the Church. See A. d'Alès, *Noratien*, 1925, and N. Kriebel, *Studien sur Trinitätslehre bei Tertullian und Noratien*, 1932.

Novation, merging of one legal obligation into another so as to extinguish the former and give a right of action only on the latter. For example, A owes B £100 for money lent, and later signs a cheque for the amount. B cannot sue A on his personal obligation to repay, but only on the cheque; and if the bank on which the cheque is drawn should fail in the meantime B would never get his money. A N. is invalid unless both parties consent to it. The term N. is rarely employed in Eng. law, the effect of merger of old obligations being determined either by the ordinary principles of contract (q.v.) or by statute.

Novaya Sibir, see NEW SIBERIAN ISLANDS.

Novaya Zemlya. Arctic land off the coast of European Russia, to which it belongs. It consists of two large is. separated by the Matochkin Shar. N. Z. forms a continuation of the Paš Khoy hills, with Vaigach Is. between it and the mainland. A number of fjord-like inlets lie on the E. coast of N. Z. between the Matochkin Shar and 75° N. The W. coast is fretted with bays and promontories. On the S. is situated the bay of Sakhanika. Further N. the Kostin Shar Straits separate Mezhdusharskiy Is. from the coast, to the N. end of which is S. Goose Cape, thus forming the S. extremity of Goose Is.; in 72° N. Moller Bay lies between Goose Land and Cape Britwin, with sev. minor bays. On the W. coast of the N. is. are Krestovaya, Mashigui, and Nordenskjold Bays, and to the N. are sev. groups of is., Gorbovyl, Pankratier, the Gulf Stream Is., and the Orange Is. N. Z. is mountainous, possesses many lakes and streams, and is intersected by deep narrow valleys. Very little is known of the interior. The Novgorod hunters are said to have visited the is. in the eleventh century. With the discovery of the N.E. passage in 1553 began a series of expeditions. In 1556 Stephen Borough was the first W. European to reach the E. extremity of the is. Baron Nordenskjold (q.v.) investigated the whole of N. Z. in 1876-77. Among the later explorers are H. J. Pearson (1895-97) and O. Ekstam (1900-3). The climate varies in parts, and glaciers are rare. There is practically no animal life on the is. There are a few lemmings and brown and white bears. On the coast abound birds, whales, seals, walruses, and dolphins. There is a small Russian colony on the S. is. Total land area (estimated) 35,150 sq. m. See A. P. Engelhardt, *A Russian Province of the North*, 1899; *Report of the Scientific Results of the Norwegian Expedition of Novaya Zemlya*, 1921, 1922.

Novel. The term N. may be said to denote a prose story. In its original use it meant a fresh story, but very soon it came to denote any story or tale in prose as opposed to a story in verse, which latter retained its old appellation of romance. Medieval romance dealt with a legendary past. The N., which seems to have had its origin in Italy soon after the Renaissance through the stimulus of foreign travel, dealt with the realities of everyday life and therein lay its fundamental attraction. Italy was indeed the home of the N., for it was there in 1350 that Boccaccio wrote his prose tales of amorous adventure, the *Decameron*, styled 'Novelle Storio' or 'Fresh Tales,' which had so profound an influence on the subsequent development of prose fiction. Nowadays the term romance is sometimes loosely used as a synonym for N. or fiction—an instance of deteriorated meaning of a word; while, in a narrower sense, the term romantic is used to differentiate N.s. of adventure or fancy or historical N.s. from realistic N.s., which are designed to represent life as it is rather than as idealised.

ANCIENT CLASSICAL PROSE FICTION.—The earliest Gk. compositions of a fic-

titious character known are the *Milesiaca*, or *Milesian Tales*, said to have been written chiefly by Aristides. Clearchus, a disciple of Aristotle, wrote a hist. of fictitious love adventures, and is thus, perhaps, to be considered the first European Gk. novelist, and the first of the long series of *Erotikoi*, who reach down to the thirteenth century A.D. Not long after came Antonius Diogenes, whose romance, in twenty-four books, entitled *Tà vñterp Õdýntr-Anagor* (Of the Incredible Things beyond Thule), was founded on the wanderings, adventures, and loves of Dinias and Dercyllis. The first names that occur in the new series are Lucius of Patra (*Patrensis*) and Lucian, who flourished in the second century A.D. The next notable name is that of Heliodorus, bishop of Trikka of the fourth century A.D. This Christian writer, whose *Lores of Theagenes and Chariclea* is probably the oldest extant *erotic* romance, far excelled all his predecessors in everything that can render a story interesting or excellent; and Tasso, Guarini, d'Urfé, and sev. other modern writers have drawn many particulars—sometimes almost verbatim—from the stories in the *Theagenes and Chariclea*. The work that next invites our attention in point of time, the *Daphnis and Chloe* of Longus, is of a totally different character. It is a simple and picturesque prose-pastoral, with no poisonings, murders, magic, supernaturalism, or impossible exploits. *Daphnis and Chloe* is the only pastoral romance produced by any Byzantine author. Of three Xenophons, also noted among the *Erotikoi*, and of uncertain date, the best is Xenophon of Ephesus, whose romance, entitled *Ephesiaca*, or the *Loves of Anthia and Abrocomes*, is in ten books. Then there appeared a work which was essentially a romance, and was composed expressly for the purpose of recommending the ascetic form of Christian life, the *Bartuam and Josaphat*, the author of which is unknown. During the Middle Ages this was trans. into every language of Christendom. In the second century Apuleius wrote his *Ass* (called from its excellence the *Golden Ass*). It supplied Boccaccio with some of his stories, and the author of *Gil Blas* with picturesque incidents.

CHINESE PROSE FICTION.—For an account of the novel in the Mongol dynasty see CHINA, *Chinese Literature*.

ROMANTIC FICTION IN WESTERN EUROPE. Is the product of new historical circumstances, which were but slightly affected by Byzantine influences. The *Erotikoi* reflect a corrupt and decaying civilisation; but medieval romances suggest a youthful, vigorous, and growing social life. They appear to have had their root and foundation in chivalry, and although the exploits and the marvels may have often been derived from foreign sources, yet the spirit, scenery, sentiment, and life of the legends reflect the characteristics of the earlier ages of feudalism. Medieval romances are divisible into three great series: (1) those relating to Arthur (q.v.) and the Knights of the Round Table; (2) those relating to Charlemagne (q.v.)

and his Paladins; (3) those relating to Amadis de Gaul (*q.v.*) and his descendants. Besides the three distinct series of romance above mentioned, a fourth perhaps deserves mention, in which the heroes of antiquity are grotesquely tricked out in the costume of medieval knights. The prin. are the romances of *Jason and Medea*, of *Hercules*, of *Oedipus*, and of *Alexander*. They are all written in Fr., and the first two profess to be the work of a Raoul le Febre.

DEVELOPMENT AND INFLUENCE OF FICTION IN ITALY.—The Ita. originated no romances of the kind described above. The earliest It. work of this sort is the *Cento novelle antiche*, commonly called *Il Norellino*. It is a compilation by different hands, all unknown. It was followed in 1358 by the *Decameron* of Boccaccio, finer in point of humour, sentiment, and style, but not more original in the matter of story than *Il Norellino*. Its influence on early European literature was prodigious. Chaucer and Shakespeare in England were greatly indebted to it for incidents and plots; while in France Boccaccio had a number of distinguished imitators. In his own country his influence was so overwhelming that for some centuries It. novelists could do nothing more than attempt to copy him. The prin. of these imitators are Franco Sacchetti, Ser. Giovanni, Massuccio di Salerno, Sabadino dell' Arlenti, Agnolo Firenzuolo, Luigi da Porta, Molza, Giovanni Brevio, Girolamo Parabosco, Marco Cademosto da Lodi, and Giovanni Giraldi Cinthio. Cinthio was the greatest favourite of all the It. novelists with the Elizabethan dramatists. Besides these we may mention Antonio Francesco Grazzini, Straparola, and Bandello. A very different class of fiction is the *spiritual romance*. It originated in the bosom of the Church. The first of the series is *Barlaam and Josaphat*, but by far the greatest work of the kind produced during the Middle Ages is the *Legenda Aurea*, or Golden Legend. Besides these may be mentioned a species of spiritual tale, the *Contes D'êtres*, prevalent in France during the twelfth and thirteenth centuries, which was written by monks.

ROMANCE OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.—During the sixteenth and seventeenth centuries four different kinds of N. were cultivated: (1) the comic romance, (2) the political romance, (3) the pastoral romance, (4) the heroic romance.

Comic Romance substantially begins in modern times with Rabelais (*q.v.*), styled by Sir Wm. Temple the 'Father of Ridicule.' Rabelais, in his inimitable burlesque romance, scoffs (with the tone of a sceptic, however) at the vices of the clergy, the crooked ways of politicians, and the jargon of philosophers. The next remarkable romance of a comic nature is the *Vita di Bertoldo* (1618) of Julio Cesare Croce, a work recounting the humorous and successful exploits of a clever but ugly peasant, which for two centuries was as popular in Italy as *Robinson Crusoe* or the *Pilgrim's Progress* in England. A few

years later appeared *Don Quixote* (1605) (*see CERVANTES*), in which 'war to the knife' was proclaimed against the romances of chivalry. Almost contemporaneous with *Don Quixote* was another Sp. romance, Matteo Aliman's *Life of Guzman Alfarache* (1599, trans. 1623) which gave birth to a host of Sp. romances with beggars and scamps for heroes, of which the best is the *Lazarillo de Tormes* (1586) by Diego de Mendoza. In the following century France produced, among others, Scarron's *Roman comique* (1651-57) and Furétière's *Roman bourgeois* (1666).

Political Romance.—The earliest of the series is the *Utopia* (1516; first trans. from original Lat. into Eng. 1551) of Sir Thomas More; next comes the *Argenis* of Barclay, pub. in 1621; and to the same class belong a variety of Fr. romances, of which by far the most famous is the *Télémaque* (1699) of Fénelon.

Pastoral Romance.—The first important work of the kind is the *Arcadia* (1506) of Nunazzaro, written in It. It was followed by the *Diana* (1559) of Montemayor, written in Sp., sev. of the episodes of which are borrowed from the It. novelists, while Shakespeare has in turn directly taken from it the plot of the *Two Gentlemen of Verona* (1623) as well as some of the most amusing incidents in his *Midsummer Night's Dream* (1600). In this class may be included also Sir Philip Sidney's *Arcadia* (1590).

Heroic Romance.—The first of this heavy series was the *Pinezandre* (1632) of Marin le Roy de Gomberville. His successor, La Calprenede, wrote *Cassandra* (10 vols., 1644-50), *Cleopâtre* (12 vols., 1647 ft.), and *Pharamond* (1662). But the most prolific of the school is Mlle de Séudry, whose prin. romances are *Artamene ou le grand Cyrus* (1648-53); *Céleste* (1654-61); *Ibrahim, ou l'Illustre Bassa* (1661); *Histoire romaine*, and *Almatide* (1661-63).

NOVELS AND ROMANCES OF THE EIGHTEENTH CENTURY.—The two European nations that most brilliantly distinguished themselves in the dept. of fiction during this century were England and France.

English Prose Fiction.—During the age of Elizabeth and her immediate successors, the imaginative genius of England, from various causes, had taken an almost exclusively poetical direction, and, with the exception of Sidney's pastoral of *Arcadia* (1590) and Bunyan's *Pilgrim's Progress* (1678), we meet with nothing in the shape of a N. or a romance for 100 years. It is certain that at the beginning of the eighteenth century England was entering on the most prosaic, unimaginative, and unheroic period of her hist. Its characteristics are faithfully reflected in most of its novels, which possess a great historical value apart altogether from their literary merits. The first name that occurs is that of the notorious Aphra Behn, the greater number of whose novels, of which *Oroonoko* (1678) is the best known, appeared towards the close of the reign of Charles II. But the first novelist of great genius, belonging to the new era is Daniel Defoe, the father

of modern Eng. prose fiction in whose writings—*The Adventures of Captain Singleton* (1720), *The Fortunes of Moll Flanders* (1722), *The History of Colonel Jack* (1722), etc.—the coarse, homely, unpoetical, but vigorous realism of the time is strikingly apparent. *Robinson Crusoe* (1719) is the finest and the most famous of all that class of fiction which was extensively cultivated in both France and England. After Defoe comes Samuel Richardson, with *Pamela* (1740), *Clarissa* (1747), and *Sir Charles Grandison* (1753). Fielding thought Richardson untrue to nature and wrote his first N. *Joseph Andrews* (1742) as a burlesque on the style of his predecessor. Like his subsequent performances, *Tom Jones* (1748) and *Amelia* (1752), it represents society as Fielding's sharper eyes saw it—on the whole gross, vulgar, and impure. T. G. Smollett writes in the same spirit as Fielding. His chief works are *Roderick Random* (1748), *Peregrine Pickle* (1751), *The Adventures of Ferdinand Count Fathom* (1753), and *Humphry Clinker* (1770). Richard Sterne exhibits a genius so whimsical, peculiar, and original that it is almost impossible to class him with any of his contemporaries.

In 1766 appeared Oliver Goldsmith's *Vicar of Wakefield*, in which a change for the better, from a moral point of view, is first noticeable. With the exception of Richardson, all the novelists above mentioned are usually described as humorists. The pub. of Percy's *Reliques* re-awakened an interest in the age of chivalry and romance. The first of the modern romantic school was Horace Walpole, whose *Castle of Otranto* appeared in 1769. He was followed by Clara Reeve, the authoress of *The Old English Baron* (1777); but the greatest genius in this line was undoubtedly Mrs. Radcliffe, whose *Mysteries of Udolpho* (1794) and other works were once abundantly imitated. Her ablest successors were Matthew Gregory Lewis, author of *The Monk* (1795), and Charles Robert Maturin, author of *Fatal Vengeance, or the Family of Montorio* (1807).

Romance in which the Incidents, though Natural, are purely Imaginary.—This class corresponds with the modern conception of the N., and probably had its prototype in *Zayde* (1670) and *La Princesse de Clèves* (1678) by Mme La Fayette; but the first great name that adorns it is that of Marivaux, whose *Vie de Marianne* (1731) and *Paysan Parrain* (1735) were long in high favour. Next to Marivaux comes the Abbé Prevost, chiefly remembered by *Manon Lescaut* (1731). Other writers belonging more or less strictly to the same div. are Mme Riccoboni and Rousseau.

Humorous and Satirical Romance.—By far the most celebrated specimens of this kind of fiction are the *Diable boiteux* (1707), the *Gil Blas* (1715–35), and *Le Bachelier de Salamanque* (1736) of Le Sage. Voltaire may fairly claim to rank among these in virtue of his *Zadig* (1748), *L'Ingénue* (1757), *Candide* (1759), and *La Princesse de Babylone* (1768).

Fairy Tales, etc.—The immediate forerunner and prototype of the Fr. fairy tales

was the *Pentameron* (1788) of Signor Basile. This attracted and stimulated the fancy of Charles Perrault, whose *Histoires ou contes du temps passé* appeared in 1697. His prin. successors were the Comtesse d'Aulnoy, Mme Murat, and Mlle de la Force.

PROSE FICTION OF GERMANY DURING THE EIGHTEENTH AND EARLIER NINETEENTH CENTURIES.—Towards the close of the century writers became more numerous, and as the literary activity of many of them continued on till the first or second quarter of the nineteenth century, it will be most convenient and natural to treat both centuries together. The first eminent Ger. novelist of this period was Wieland (*Geschichte des Agathon*, 1766–67, and *Oberon*, 1780). The prin. names of novelists influenced by Richardson and Fielding are August la Fontaine, Wetzel, Maier, Müller, Schulz, and Hippel. Almost contemporary with these there flourished for a brief period (1780–1800) a school whose works had their poetic counterpart in Schiller's *Die Rauber* (1781). The chief writers of this *Sturm und Drang* period are Cramer, Spiers, Schlenkert, and Velt Webor. Alone and far above all others in abundance and originality of fancy, humour, and pathos, towers Jean Paul Richter (*Quintus Flickein*, 1796). Apart from all schools stands Johann Wolfgang von Goethe (q.v.), whose Ns. (*Die Leiden des jungen Werthers*, 1774, *Wilhelm Meisters Lehrjahre*, 1795–96, *Die Wahlverwandtschaften*, 1809, *Wilhelm Meisters Wanderjahr*, 1829), as well as his poems, are poetico-philosophic efforts to represent, perhaps to solve, the great facts and problems of human life and destiny. *Wilhelm Meister* became the prototype of the romantic N., and influenced in particular Franz Sternhals's *Wanderungen* (1798), by Ludwig Tieck, and Wackenroder, and Novalis's *Heinrich von Ofterdingen* (unfinished, pub. among his Works, 1802). Other distinguished names are those of De la Motte Fouqué, Adelbert von Chamisso, Achim von Arnim, Clemens Brentano, and E. T. A. Hoffmann.

SOME ENGLISH FICTION OF THE NINETEENTH CENTURY.—The century began with the ironical, perceptive genius of Jane Austen, but her immediate influence was annulled by Scott's *Waverley* Ns., which set the fashion for historical romance throughout Europe. Though he had some antecedents, including Maria Edgeworth's picture of Irish life in *Castle Rackrent* (1800), Scott may be said to have been the real inventor of the historical N. Possessed at once of far greater antiquarian learning, imaginative genius, sound sense, and instinctive taste than any of his 'romantic' predecessors, he knew precisely what to shun and what to choose. The political reaction that took place in Britain showed itself in literature too, and Sir Walter Scott was its grandest representative. He strove to delineate the past as it seemed in the eyes of men who were dubious of the present and afraid of the future. The overpowering genius of

Scott necessarily led to endless imitation, but the only one of his followers who holds a tolerably good position in literature is G. P. R. James. Galt and Wilson portrayed aspects of Scottish life which the author of *Waverley* (1814) had passed over. After Scott Bulwer (Lord) Lytton developed romantic and historical fiction, but his domestic Ns. reflected Jane Austen's belated influence on the popular taste. Her powers of observation were inherited by George Eliot, who in 1858 pub. in two vols. *Scenes of Clerical Life*. Her later Ns. entitled her to rank as one of the three great Eng. novelists of the nineteenth century. The other two, Dickens and Thackeray, brought the Eng. social N. to its zenith and with their work may be linked the philanthropic Ns. of Mrs. Gaskell and the 'Barsetshire Ns.' of Anthony Trollope. Among much talented and individual work may be noted the nautical Ns. of Marryat; the political Ns. of Benjamin Disraeli; the sporting and military Ns. of Charles Lever; the brilliant 'muscular Christian' Ns. of Charles Kingsley; the 'governess Ns.' as they have been aptly denominated of Charlotte Brontë; the 'school' novels of Thomas Hughes and Dean Farrar; and the 'sensational' Ns. of Wilkie Collins, Miss Braddon, and others. Other authors not less eminent are Mrs. Oliphant and Charles Reade. One novelist of this period stands apart from his contemporaries: Thomas Love Peacock, who invented a N. of shadowy characters, containing irony, and conversation, and a mockery of romantic excesses.

TENDENCIES IN THE EUROPEAN NOVEL IN THE SECOND HALF OF THE NINETEENTH CENTURY.—At the century's beginning, in addition to the lyrical and personal romances of F. R. Chateaubriand and Mme de Staél, the Fr. N., in the hands of De Vigny, Victor Hugo, and, in its decline, of Dumas père and Eugène Sue, was mainly historical. The influence of Goethe and the Ger. romance was manifested in France in the idealistic Ns. of George Sand. Then, with a greater admixture of realism, come the Ns. of Honoré de Balzac, who set out to give an exact picture of contemporary manners. Allied to him in the 'realist' school are Stendhal and Prosper Mérimée, while the second half of the century is dominated by Gustave Flaubert, who succeeded in fusing the romantic and the realistic. He, like Balzac, portrayed the physical environment of life as the determining factor in character, and from his work derive the modern N. as a conscious artistic form. Before Flaubert and his contemporaries the only comparable author is Jane Austen, who is their equal in form. From Flaubert are descended directly such later Eng. writers as George Moore, and others who reveal more or less directly the influence of the Fr. naturalistic movement from Flaubert to Zola are Hardy, Gissing, and Conrad. Leaving aside a romantic recrudescence by followers of George Sand—Feuillet, Cherbuzie, and Fromentin—the naturalist N. was further developed by the brothers

Goncourt and Alphonse Daudet, but naturalism was not formulated into a theory of art until Emile Zola did so. He and De Maupassant were responsible for the spread of naturalism throughout Europe, evidenced in the Norwegian August Strindberg, in the Ger. social Ns. of Spielhagen, Theodor Fontane, Otto Ludwig (*Zwischen Himmel und Erde*, 1853), J. Gottheil, and Gottfried Keller (*Der grüne Heinrich*, 1851–53), and in the Sp. realist, José María de Perla, followed by Armando Valdés. In the It. N. Fr. influence is recognisable. The chief of the It. realist school is Giovanni Verga, whose most prominent followers were Luigi Capuana, De Roberto Fogazzaro, and D'Annunzio, all of whom also achieved European reputations, though their talent is more romantic than that of their contemporaries. In England the influence of the Fr. naturalists is seen especially in the works of Arnold Bennett, but the Eng. social N. is indigenous, and has tended towards sociological study—witness the work of H. G. Wells and John Galsworthy. The Eng. N., a fact which Flaubert deplored, is loose in structure, and in this respect is allied more with the Russian N. than with the Fr.

The first part of Tolstoy's *War and Peace* appeared in 1865 and the N. was completed four years later. Realism, which in W. Europe was a moral revolt against untrue romanticism, was, in Russia, a natural growth free from theorising, being present before Tolstoy in Gogol and Turgenieff, and after him in Goncharov and Dostoevsky. The contribution of the Russian novelists, epitomised in Tolstoy, is in the shift of emphasis from the physiological to the psychological. Though Tolstoy was Russia's greatest novelist it was Turgenieff who influenced European literature most, since he combined Russian concentration on the psychology of his characters with Fr. artistry and compactness of form. By this fusion Turgenieff may be said to have bridged effectively the gap between W. and E. European literary currents. Henceforward novelists tended to follow a general European pattern and to divorce themselves more and more from their national background. Turgenieff had direct literary descendants in the Amer. Henry James and the Eng. John Galsworthy; and has strongly influenced contemporary Eng. novelists, notably Rosamond Lehmann and Charles Morgan. The more violent treatment of Dostoevsky has been adapted completely and successfully only by D. H. Lawrence, although his style has influenced other writers in lesser degrees. The emphasis on the psychological seconded by the growth of scientific psycho-analysis was the dominant feature in the work of many other late nineteenth-and twentieth-century novelists; in England these included Hardy, Meredith, Joyce, Aldous Huxley, and Virginia Woolf; in France Anatole France, Gide, Barros, Mauriac, and Proust; in Germany Thomas Mann and Jacob Wassermann; in Austria Stefan Zweig; in Russia, Tchekov, Gorki,

and Pilimak; and in Spain Pérez Galdos and Azorín.

The internationalisation of the N., for which Turgeniev must be held primarily responsible, has been one of the most remarkable features of twentieth-century development, especially in England. Previously novelists had been susceptible to foreign influences, but their work had usually retained a distinctively national stamp. From about 1880 onwards this is gradually changed. In Hardy and Meredith foreign influence is not allowed to hide a fundamentally Eng. creation. Hardy possessed the breadth of vision of Flaubert and Balzac and the psychological interest of Turgeniev; but he remains supremely a descendant of the Shakespearian school of tragedy. In many of Meredith's works, such as *The Egoist*, the influence of Turgeniev and the Fr. school is very marked; but the connection between such Ns. and the Eng. Restoration tradition of the comedy of manners is retained. But later writers frequently dismiss or overlay such foundations. The works of Virginia Woolf, Gide, Lawrence, and Joyce owe comparatively little to the country of their authors' birth. Eng. novelists have been particularly affected by foreign trends; in Russia and Germany the N. has retained a much more national flavour. It has been suggested that by the nineteen-thirties Eng. novelists were borrowing from the fund of European ideas more than they gave; but contemporary novelists, such as Maughan, have maintained a distinctive Eng. school, while absorbing the best of foreign ideas and forms. Many outstanding novelists, however, have continued to rely heavily on European, particularly Fr. tradition: of these Charles Morgan has been the most successful, and his books are possibly more widely known in France, the country of his literary adoption, than in England.

THE MODERN NOVEL.—Since other classes of imaginative literature, both the drama and some kinds of poetry, are so closely akin to the N. it is not easy to discuss fundamental questions regarding the N. without trenching upon matters relating to these other classes. Thus the *Aeneid*, *The Ring and the Book*, and *The Dynasts* are essentially Ns. in verse and, apart from points of poetic technique, any discussion of the N. in general applies as validly to them as, for example, to *War and Peace* and *Martin Chuzzlewit*. If the N. is merely 'a long story usually in prose,' can there be any value in a discussion either of its form in general or of its tendencies? Or again, if its form is not limited, as is that of the drama, by conditions of presentation, why should it have form at all? Generally speaking, as Mr. Percy Lubbock has shown in his book on the N. (*The Craft of Fiction*, 1921), novelists have never paid any undue regard to form, and the whole course of European fiction shows that the main preoccupation of the novelist who has a story to tell is to tell it and to use any form which seemed to him to be the most suitable vehicle for conveying his inten-

tion. This would certainly seem to be true of the Ns. of the last century, and in this connection it is probably misleading to speak of the 'modern' or contemporary N. when that term should, strictly, include only the works of a few writers who have attracted notice from professional critics on account of some conspicuous quality or even want of quality, but accompanied by some creative force; and some prominent critics are agreed that if vague ethical or sociological considerations are allowed to override aesthetic considerations the whole art of the N. is in danger of dissolution, particularly as the aesthetic is the primary consideration for by far the greater number of Ns. produced. Much that is ill-founded and conflicting has been said by both critics and novelists about the relation of the N. to life, for truth to life means different things to different readers and most readers have a sure enough grasp of life through reflection upon experience not to be at all likely to turn to fiction for further instruction. The collapse of the N., as indeed of other forms of literature in Germany and Italy in the past decade or more, is an eloquent commentary on the results of the interference with art by totalitarian govs. making use of intimidation and control of production in order to force upon artists the attitude that they regard as proper.

The twentieth-century European N. is distinguished by variety and licence of experiment. The novelist has become the purveyor of life's experience for the benefit of those whose experience is limited, and this has approximated fiction to journalism (not in a derogatory sense). It has been well said that H. G. Wells was a pioneer in the attempt to transform the N. into an intellectual clearing-house. The result of this attempt has been to bring into vogue the unsymmetrical or shapeless N. Wells's later Ns. and those of Proust, Joyce, Virginia Woolf, and Dorothy Richardson and, in America, Wm. Faulkner, Ernest Hemingway, and many others (see next section) are amorphous in the sense that they all show a strong tendency to free the art of N.-writing from the accepted canons of plot and dialogue so as to give scope for altogether wider activities. The element of justification in this 'shapeless' construction was that the 'realism' or 'naturalism' of the older Ns., such as those of Zola, the Goncourt brothers, George Gissing, and Arnold Bennett, was not really true to life. Hence this reaction to ultra-realism and the N. which pretends to reveal the 'stream of consciousness,' i.e. the N. which aims at getting rid of everything that might stand between the reader and the reflections in the character's mirror of consciousness. But this experimentation went to extreme lengths, as in Joyce's *Ulysses* (1922) in which the 'recurrent themes' and 'internal rhythms' seem to have no permanent value (see further under JOYCE, JAMES). *The Voyage Out* (1915) and other Ns. of Virginia Woolf reveal a world of radiance and a high degree of sensitiveness, emotional

and intellectual, yet are often fragmentary in presentation and wanting in continuity of narrative. But in these 'shapeless' N.s. the characters seem to have no existence outside the author's mind. At least the characters of Wells, Galsworthy, Bennett, and Conrad were substantial. Proust's method attracted many copyists after his death in 1922. His long continuous N. *A la recherche du temps perdu* (trans. as *Remembrance of Things Past*, 1913) is a highly subjective work, which explores consciousness regardless of time sequence and with a leisurely reflectiveness. His characters' sole aim seems to be to 'fill an infinite void of leisure with the satisfaction of insignificant appetites and the stimulation of largely artificial emotions.' The reader is indifferent to their fate, for their whole world dissolves into complete passivity, aimlessness, and futility. How different from the state of positive anxiety with which one follows the fortunes of the characters in a N. by Fielding, Trollope, or Hardy. Twentieth-century naturalism may be said to have ended with Arnold Bennett's *Riceyman Steps* (1923); but the N.s. of the 'shapeless school' which displaced it and seek realism in form rather than in content can hardly be condemned because they so far evade life as to avoid the central issues of our age, such as the threatened disintegration of society in the Fascist-Communist struggle. The day of the experimentalist may be said to be always dawning, but that of the traditionalist can never be said to be definitely past. Joseph Conrad was an experimentalist in a traditionalist framework. By contrast with his introspective brilliance Hugh Walpole was a mechanical traditionalist, painstaking, solid, undistinguished. E. M. Forster, in method, is a mid-nineteenth-century novelist, displaying an orderly unfolding of story and character. Imagination is the most powerful element in his universe. Life as he sees it is supremely strange and it is only through the imagination that man can hope to penetrate its mystery. Sentimentality, which is pervasive in Virginia Woolf, is idealistic and incidental to Forster; while half-heartedness about sexual love may be said to be another impression made by both these novelists. A. P. Herbert's *The Water Gypsies* (1930) is, in form, traditional, but has much in it that is fundamentally true to life. Its method is in sharp contrast with that of D. H. Lawrence, whose N., *Lady Chatterley's Lover* (1928), illustrates the author's constitutional inability to deal dispassionately with certain emotional relationships (see further under LAWRENCE, DAVID HERBERT). Markedly different from the N.s. of the experimentals is the work of such writers as J. B. Priestley, whose *The Good Companions* (1929) is a reversion to the hurly-burly of Dickens's world; G. B. Stern, whose *Tents of Israel* (1924), a 'family chronicle' N., has few superiors in that category; and Tennyson Jesse, whose *The Lacquer Lady* (1929) is remarkable for vivid portrayal of varied experiences. The N.s. of Aldous Huxley seem to stand alone—

devastating satires with something of the unemotional precision of the analytical chemist. His *Point Counterpoint* (1928) and *Antic Hay* (1923) are essentially the N.s. of a moralist who is out to expose by the process of stripping off the masks of falsity and cant, the ugliness of bohemianism and other aspects of contemporary life. Wyndham Lewis suggests that all art to-day is in fact satire. Thus he assumes that the Amer., Faulkner, is a 'fierce moralist, who operates upon the satiric plane, armed with sardonic weapons of aggression against the victims of his ethical rage,' and it is obvious that his own N.s. are of this genre. In this period too there were occasional successful essays in the field of fantasy, such as David Garnett's *Lady into Fox* (1922) and Sylvia Warner's *Lolly Willowes* (1926).

The aftermath of the First World War brought N.s. of disillusionment such as Erich Remarque's *Im Westen Nichts Neues* (trans. as *All Quiet on the Western Front*, 1929); Richard Aldington's *Death of a Hero* (1929), C. E. Montague's *Disenchantment* (1922) and H. M. Tomlinson's *All Our Yesterday* (1930)—books of very varying literary quality but all alike a protest against war, without any attempt to exploit the social background as a cause of war. Among other novelists who have taken the war as their theme are Robert Graves, R. H. Mottram, Arnold Zweig, Josef Hasek, and Herbert Itend, whose N.s. unlike Tolstoy's masterpiece of the Napoleonic wars, deal rather with particular experiences than with general truths. Few of them have rivalled Henri Barbusse's *Le Feu* (1916), which, in descriptive narrative, shirks nothing in the task of reflecting the fatigue, tedium, and horror of war. Two other notable war N.s., *Her Privates We*, by Private 1922 (Frederick Manning) (1930), and *War is War*, by Private X (1930), the former, perhaps, the best Eng. N. on the war, are the work of educated and imaginative men and not the unvarnished tales of characteristic private soldiers. Mottram's *The Spanish Farm* (1921), a dispassionate and detached war N., is more remarkable for its central character, who seems to typify the Fr. farming woman in a war-scarred region throughout the centuries, than for its narrative of experiences. H. E. Reade's *In Retreat* (1925), on the Fifth Army, is pseudo-fictional. Robert Graves's *Goodbye to All That* (1929), like Stephen Graham's *Private in the Guards* (1919), is a protest against military discipline and snobbery. *The Case of Sergeant Grischa* by Arnold Zweig (1929) is a fine literary performance, yet its merit lies more in the travels of its unemotional hero than in its war interest. Hasek's *The Good Soldier Schweik* (1930) is an extravagantly comic satire on military tyranny and pomposity.

In Germany, before the Hitlerian regime, there was a literature of revolt, which included the N.s. of Heinrich and Thomas Mann, Theodore Plivier, and Ludwig Renn, most of it unknown in England. The N.s. of Helmut Maun, the acknowledged master of Wassermann and

Feuchtwanger, portray a Germany in all its recent vulgar prosperity in the decades preceding the First World War. Thomas Mann's Ns. are better known in England and America. His chief N., *Buddenbrooks* (1901), may be described as the Ger. counterpart of the *Forsyte Saga*. After the collapse of the Weimar Republic and the dawn of Fascism in Germany, came writers like Baldor Olden, whose Ns. give true pictures of demagogic in the Fatherland; but such writers were either forced to escape or run the risk of internment in a concentration camp. Ger. literature as a whole, following the Nazi condemnation of the Ns. of Reinhardt and Han. Fallada, merely extols the law of the jungle. Thomas Mann, who left Germany in 1933 and became an Amer. citizen, pub. in 1948 *Dr. Faustus*, perhaps his greatest N.

Soviet novelists are also circumscribed in their activities by the political outlook of the regime. Among the best-known of Ns. of the revolution and civil war are Sholokhov's *And Quiet Flows the Don* (1934)—familiar to Eng. readers—and Alexey Tolstoy's *Darkness and Dawn* (1935), a picture of the Russian intelligentsia during and after the First World War. Sholokhov's *Virgin Soil Upturned* (1935) is a masterly presentation of peasant life. Kataev's *Forward, O Time* (1934) is an example of the type of N. which purports to reflect the tempo of the five-year plan. The Ns. of Ilya Ehrenburg picture the unhappy Russian intellectual of the old type who cannot adjust himself to the new standards of objectivity.

The Second World War, apart from providing new material, did not greatly affect N. writing. New writers came to the fore and estab. ones produced new work. Among those deserving special mention are Graham Greene, a powerful writer on themes of a spiritual nature and great psychological insight (*Brighton Rock*, 1938, *The Power and the Glory*, 1940, *The Heart of the Matter*, 1948); Evelyn Waugh, who is chiefly a satirist (*Brideshead Revisited*, 1947); Ivy Compton Burnett, Rosamund Lohmann, H. E. Bates, F. L. Green, Henry Greene, and Storm Jameson (*The Moment of Truth*, 1949). The tendency of the younger novelists was a concern with the deeper realities of life rather than with manners, and the school of James Joyce and Virginia Woolf has not found a great following. Of the older generation W. Somerset Maugham is the doyen, a member of the realist school and of great technical skill (*Of Human Bondage*, 1915, *The Moon and Sixpence*, 1919, *Cakes and Ale*, 1930). He also, in *The Razor's Edge* (1943), left the ironical social scene for a deeper theme. Aldous Huxley has been drawn towards a sort of eclectic mysticism, exemplified in *Time Must Have a Stop* (1944), and Charles Morgan, leaving the philosophic heights of *The Fountain* (#33), has written searching Ns. on moral problems (*The Judge's Story*, 1948, and *The River Line*, 1949). Good work has also been done by Elizabeth Bowen, Christopher Isherwood, Nigel Balchin, and Gerald Bullett.

Of Fr. novelists, the most outstanding are André Gide (*Les Faux Monnayeurs*, 1926), Georges Duhamel (*Les Pasquier*, 1933-44), and François Mauriac (*A Woman of the Pharisees*, 1946).

THE AMERICAN NOVEL.—The epistolary N. of Richardson had its vogue in America with such authors as Sarah Morton and Hannah Foster, but the first professional novelist was Charles Brockden Brown, whose novel, *Wieland*, appeared in 1798. He reflects the theories of Godwin and the Eng. revolutionaries, and his books have the romantic realism of the European terror N. But his qualities are American, and with Fenimore Cooper (*The Last of the Mohicans*, 1826) romance and adventure became the substance of American fiction with influence in Germany and France and on the Eng. nautical N. The work of his followers (Neal, Thompson, W. G. Simms) culminated in the romances of Hermann Melville (*Typee*, 1846, *Moby Dick*, 1851). In 1850 *The Scarlet Letter* appeared and Hawthorne's romances from 1850 to 1870 shared their popularity with Harriet Beecher Stowe's sentimental tales (*Uncle Tom's Cabin*, 1852). The short story of Bret Harte and his imitators obscured the N., but W. D. Howells and Henry James had begun writing, and in the eighties came a renaissance of the N. Howells was strongly affected by his admiration for Tolstoy, while Zola's influence was also making itself felt. With the exception of historical romance in the manner of Stevenson (Mary Johnston, Winston Churchill, the early Booth Tarkington), naturalism prevailed in fiction (Edgar Howe, Hamlin Garland, Henry Fuller, Ambrose Bierce, Stephen Crane, Frank Norris, and, in the twentieth century, Theodore Dreiser and Sherwood Anderson). Satire of contemporary American life has found its exponents in Sinclair Lewis and Fannie Hurst, while satire of a different order—an idealist reaction against naturalism—is found in the work of J. B. Cabell. Cabell is a stylist; and delicacy of perception and expression characterises the New England school of fiction which, naturalist in the main with Henry James at its head, includes important contemporary novelists, Willa Cather, Edith Wharton, and Joseph Hergesheimer. Of a different order is the work of Thornton Wilder, who seeks his inspiration in the romantic past of Sp. America or the Aegean isles.

Contemporary American literature seems to show that while critics are still debating the nature of the relation between fiction and social purpose, the largest reading public has, of its own motion, enthusiastically sought a whole series of romantic novels of which the two most popular, Hervey Allen's *Anthony Adverse* (1933) and Margaret Mitchell's *Gone with the Wind* (1936), have had an international vogue. Among still living novelists, whose reputation seems most securely founded in America, are Sinclair Lewis, Theodore Dreiser, and Willa Cather; but, whereas the two first named belong definitely to the post-war era of the 1920's, Miss Cather's realistic pictures of a re-

cently forgotten Amer. past belong to no school of fiction and her *My Antonia* (1918) and *The Song of the Lark* (1915) are regarded as part of permanent Amer. literature, and this may also be true of her later books, even the somewhat experimental *Death Comes to the Archbishop* (1927). More recent writers of note include Ernest Hemingway, Erskine Caldwell, and Pearl Buck. Pearl Buck's novels of Chinese life, particularly *The Good Earth* (1931), won for her the Nobel prize, she being the third Amer. to be so honoured (the other two being Sinclair Lewis and Eugene O'Neill). Ernest Hemingway and Erskine Caldwell have most distinctive styles and are noted for an ideology of Socialist affinities. Two of Caldwell's best novels, *Tobacco Road* (1932) and *God's Little Acre* (1933), as also many of his short stories, are concerned with the life of the depressed agric. classes of the S. and are instinct with grim realism and vivid creative imagination. Other novelists are John Steinbeck, whose *Of Mice and Men*, 1937, belongs to the robust school of Hemingway; Marjorie Kinnan, who writes of Florida life; and Elizabeth Madox Roberts, who deals poetically with the rural S. Other well-known novelists are Thomas Wolfe, Dos Passos (*42nd Parallel*, 1930), Wm. Faulkner, Upton Sinclair (*Oil*, 1927), Thornton Wilder, the author of *The Bridge of San Luis Rey* (1927), and John Marquand (*Wickford Point*, 1939, *So Little Time*, 1944).

See also DETECTIVE STORY, THE.

See J. Dunlop, The History of Fiction, 1814; Sir W. Scott, The Lives of the Novelists, 1825; D. Masson, British Novelists and their Styles, 1850; W. Forsyth, Novels and Novelists of the Eighteenth Century, 1871; E. Zola, Les Romanciers naturalistes, 1883; Sir W. Raleigh, The English Novel (to 1800), 1894; W. L. Cross, The Development of the English Novel, 1899; G. Saintsbury, The English Novel, 1913; H. James, Notes on Novelists, 1914; G. von Lukács, Die Théorie des Romans, 1920; P. Lubbock, The Craft of Fiction, 1921; E. A. Baker, The History of the English Novel, 1921-39; G. Duhamel, Essai sur le roman, 1925; A. Thibaudet, Le Liseur de romans, 1925, and Réflexions sur le roman, 1938; R. E. Prothero (Baron Ernle), The Light Reading of our Ancestors, 1927; W. Rehm, Geschichte des deutschen Romans, 1927; F. Mauriac, Le Roman, 1928; A. C. Ward, Twentieth-century Literature, 1928, and Literature of the Nineteen-Twenties, 1930; R. M. Lovett and H. S. Hughes, The History of the Novel in England, 1932; H. Hatcher, Creating the Modern American Novel, 1935; P. Henderson, The Novel To-day, 1936; P. Valéry and others, Problèmes du roman, 1943; A. Comfort, The Novel and our Time, 1943; W. van O'Connor, Forms of Modern Fiction, 1949; W. Allen, Reading a Novel, 1949; and W. Somerset Maugham, A Writer's Notebook, 1949.

Novelle, see JUSTINIANUS, FLAVIUS ANICIUS.

Novello, Clara Anastasia (1818-1908), Eng. soprano singer, daughter of Vincent N., b. in London and trained in Paris.

She made her first public appearance in England in 1832, and from then until her retirement in 1860 she was regarded as one of the greatest vocalists in concert, opera, and oratorio, both in England and on the Continent. See her *Reminiscences* (1910), compiled by her daughter Contessa V. Gigliacci.

Novello, Ivor (b. 1893), original name Ivor Novello Davies, b. at Cardiff, son of Clara Novello Davies (1861-1913), Brit. singing instructor, choral conductor, and founder and conductor of the Royal Welsh Ladies Choir. N. first appeared on the stage in 1921, but had already won some success as a song writer, his *Keep the Home Fires Burning* being very popular during the First World War. His musical plays and revues include *Tabu* and *The House that Jack Built*, and, as his own actor-manager, *The Rat* (written in collaboration with Constance Collier). His own plays include *The Truth Game* (1928) and *Symphony in Two Flats* (1929); while other plays which he acted in and managed were *Murder in Mayfair* (1934); *Glamorous Night* (1935); *Carless Rapture* (1936); *Crest of the Wave* (1937); *The Dancing Years* (1939); *Perchance to Dream* (1945); and *King's Rhapsody* (1949). He has also acted star parts in many films.

Novello, Vincent (1781-1861), Eng. musician and composer, was b. in London, where he held posts as organist from 1796 to 1822. He ed. the Masses of Haydn and Mozart, the works of Palestrina, and other fine music hitherto unknown in England. He composed a vast quantity of sacred music, and with his pub. of the first vol. of his original work in 1811 laid the foundation of the publishing firm of N. and Company. He was the founder of *Musical Times*, and shared in the foundation of the London Philharmonic Society. See M. Cowden-Clark, *The Life and Labours of Vincent Novello*, 1863.

November, eleventh month of the year. derives its name from the Lat. *noven* (nine), as, until the Julian arrangement, it was the ninth month of the old Rom. year, which began in March. There are thirty days in the month; the 11th was considered by the Romans as the beginning of winter, and the *epulum Jovis* (banquet of Jupiter) was held on the 13th.

Novgorod, formally known as *Veliki Novgorod* (Great Novgorod), tn. of Russala, cap. of the N. Region of the R.S.F.S.R., and formerly the seat of an archbishop of the Orthodox Gk. Church. The tn. is situated 119 m. S.S.E. of Leningrad, and lies on the banks of the Volkhov, 2 m. from its source in Lake Ilmen. Pop. 40,000. The kremlin, or citadel, is situated on the north shore of the riv., and includes the cathedral of St. Sophia, which was built about the middle of the eleventh century. It fell into decay, but was restored between 1893 and 1900. The Yaroslav Tower is historically connected with the common council, which used to meet there. There is also a monument erected to commemorate the thousandth anniversary of the foundation of Russia (built 1862). Another similar monument

was erected to perpetuate the repulse of Napoleon in 1812. Previous to the Tatar invasion N., with Kiev, was the chief centre of the Russians. In 997 its inhabitants obtained from their own prince, Yaroslav, a charter of self-government, and for five centuries this charter was regarded as the chief written testimony of the independence of N. in its struggles with the princes. The people of N. (who are said to have numbered 400,000 in the fourteenth century, but it may be assumed that it was once over 100,000) selected their princes from the sons of their liberator Yaroslav, or some other branch of the family of Rurik. They carried on trade with the Hanseatic and Scandinavian cities, and colonised the basins of the northern Dvina. They also descended the Volga in the fourteenth century, and made trading expeditions as far as Siberia. Their peace was at last disturbed by their struggle against the Suzdal reign, followed by the encroachments of the Swedes and Gers. These invaders they repulsed in the battles of Ladoga (1240) and Pskov (1242). The marshes of their country prevented a Mongol invasion in 1240-42. Ivan III. and his Muscovite followers in 1456 attacked her after depriving her of two colonies; and she at last had to fight desperately for her liberty, which she did with small success under Marthe Boretskaya, the mayor. Ivan III. entered N. and deprived her of her charter. Ivan IV. (the Terrible) burnt the city in 1570, and put some 15,000 of its inhab. to the sword.

In the Ger. invasion of Russia in 1941 N. suffered great destruction.

Novgorod-Syevorsk, tn. of the Chernigov Region of the Ukrainian S.S.R., 110 m. N.E. by E. thereof, on the r. b. of the Desna. Pop. 10,000.

Novi, or **Novi Ligure**, tn. of Piedmont, Italy, in the prov. of, and 14 m. S.E. of the city of, Alessandria. Weaving and the manuf. of silk goods are important industries. Pop. 21,100.

Novice, person who, after a period of probation as a postulant, is admitted to a religious order to be trained in the religious life, with a view to becoming a professed member of the order. The period of training, called the novitiate, varies in length with different religious orders.

Novikov, Nikolai Ivanovich (1744-1818), Russian author, b. at Avdotjino in the gov. of Moscow, who founded a review at Moscow entitled *Jirupissets* (the Painter) in 1769, and managed the *Gazette of Moscow*. The review was suppressed in 1774. N. did not spare himself in endeavours to improve social conditions and to advance public education. He was imprisoned by Catherine II. in 1792, and was not released until the reign of Paul I. His works include *Library of Old Russian Authors*, in 30 vols., and the *Dictionary of Russian Writers*.

Noviodunum, see NEVERS.

Novi-Sad, cap. of Vojvodina Prov. Yugoslavia, 42 m. N.W. of Belgrade. There is an airport; cotton goods and pottery are made. Pop. 77,100.

Novo, see CASTELNUOVO.

Novocaine, synthetic alkaloid which in the form of its hydro-chloride, $C_{12}H_{20}O_4 \cdot HCl$, is widely used as a local anaesthetic in dentistry, etc. It is much less toxic than cocaine, which it has largely displaced.

Novo-Cherkask, or **Novo-Tcherkask**, tn. of the Rostov Region of the R.S.F.S.R., at the junction of the Don and the Aksal, 40 m. from the sea of Azov. Locomotives are made at N., and there is trade in wine, anthracite, timber, and corn. Its new cathedral was completed in 1904. Pop. 81,300. See also EASTERN FRONT IN SECOND WORLD WAR.

Novo-Georgievsk: 1. Or Krylov, tn. in the Kirovograd Region of the Ukrainian S.S.R., at the junction of the Tyasmyn and the Dnieper, 17 m. W.N.W. of Kremenchug, has a large trade in timber, grain, and cattle. Captured by the Gers. in the invasion of the Ukraine, it was recaptured by the Russians in March 1944. Pop. about 15,000. 2. Or Modlin, fortress of Poland, 23 m. N.W. of Warsaw, at the junction of the Narev and the Vistula. N. sustained severe sieges in 1813, 1830-1831, and in Aug. 1915. Taken by the Gers. in 1941, it was recaptured by the Russians in 1945.

Novo-Moskovsk, tn. of the Dnepropetrovsk Region of the Ukrainian S.S.R., 10 m. N.E. of Dnepropetrovsk, on the R. Samara. Pop. 15,000.

Novorossiisk, seaport of the Krasnodar Ter. of the R.S.F.S.R., on the Black Sea, 60 m. S.W. of Ekaterinodar, has an excellent natural harbour supplemented by a breakwater. There are four large cement works located on the harbour front. A mt. of raw material supply lies immediately back of these plants, the rock being quarried and hauled down to the water's edge for an average distance of 2 km. The largest of these plants was built fifty years ago by Fr. concessionaires. N. exports petroleum, wheat from the Caucasus, wheat and timber from the Volga lands, and cement, and boxboard. Possession of the port was hotly contested in 1912-43 (see further under EASTERN FRONT; RUSSO-GERMAN CAMPAIGN IN SECOND WORLD WAR). Pop. 95,300.

Novosibirsk, cap. of the region of the same name in the R.S.F.S.R., is the centre of a coal-mining and an important industry. Pop. 405,600.

Novo-Tcherkask, see NOVO-CHERKASK.
Novo-Zaporozhe, see ZAPOROZHE.

Nowa Sól (Ger. Neusalz), tn. of Silesia, Poland, on the Oder, 18 m. from Głogow (Glogau). There are manufs. of yarn, paper, soap, and iron. Pop. 16,400.

Nowgong: 1. Dist. of Assam, India. Area 3895 sq. m. Pop. 710,800. 2. Cap. of the above dist., on the Kalang R., 60 m. E. by N. of Gauhati. Pop. 5400. 3. Th. and cantonment of Bundelkhand, India. Its college was estab. in memory of Lord Mayo. Pop. 6000.

Nowshera, or **Naushara**, tn. and cantonment of the N.W. frontier. Prov. of Pakistan, 25 m. E. of Peshawar. Pop. 7000.

Noyes, Alfred (b. 1880), Eng. poet and

author, b. in Staffordshire and educated at Exeter College, Oxford, began his literary career as a contributor to various magazines, among them *Blackwood's*, the *Spectator*, *Fortnightly Review*, the *Bookman*, the *Cornhill*, and the *Nation*. He has also written for Amer. pubs., and in Feb. 1913 left England for a tour in the U.S.A., where he lectured on poetry. In 1914 he was elected to the professorship of modern Eng. literature on the Murray Foundation, Princeton Univ., resigning in 1923. His *Torch-bearers* is one of the very few recent attempts at epic poetry which have achieved any measure of success. It is an epic of man's conquest of scientific knowledge, and may, in this respect, be compared with Miss B. Sackville-West's epic *The Land*. Elgar and other composers have set sev. of his lyrics to music. In 1930 N. was received into the Rom. Catholic Church. Among his works are *The Loom of Years* (1902); *The Flower of Old Japan* (1903); *The Forest of Wild Thyme* (1905); *Drake* (1908); *William Morris* (Eng. Men of Letters, 1908); *The Enchanted Island and other Poems* (1909); *The Temple of Beauty* (1910); *Tales of the Mermaid Tavern* (1913); *Rada* (play, 1915); *A Salute from the Fleet* (1915); *Walking Shadows* (short stories, 1917); *The Elf Artist* (new poems, 1920); *Selected Verse*, including 'The Victory Ball' (1921); *The Torch-bearers* (an epic of scientific discovery), vol. I.—*The Watchers of the Sky* (1922); *The Hidden Player* (novel, 1924); *Songs of Shadows-of-a-Leaf* (lyrics, 1924); *The Torch-bearers*, vol. II.—*The Book of Earth* (1925); *Ballads and Poems* (1927); *The Torch-bearers*, vol. III. (1930, in one vol. 1937); *The Unknown God* (1934); *Voltaire* (1936); *Orchard's Bay* (1939); *The Last Man* (1940); *The Edge of the Abyss* (1944); *Shadows on the Down* (verse, 1945); and *Portraits of Horace* (1948).

Noyes, John Humphrey (1811–86), founder of the Perfectionists, b. at Brattleboro, Vermont, U.S.A. He eventually founded a community at Putney, the tenets of the sect being Communism in everything, including marriage. The sect afterwards went to Oneida, New York, but N. found himself in difficulties owing to his free ideas with regard to marriage. He wrote *The Doctrine of Salvation from Sin explained and defined* (1843); *The Bercan* (1847); and *History of American Socialism* (1870).

Noyon, tn. in the dept. of Oise, France, 67 m. N.E. of Paris. Its cathedral dates from the twelfth century, and was severely damaged by bombardment in the First World War. It has also a bishop's palace. The chief industries are sugar refining, tanning, and the manuf. of textile goods, chemicals, and sheet-iron. N. is the bp. of Calvin. Pop. 6600. See R. L. Stevenson, *An Inland Voyage*, 1878, and M. Aubert, *Noyon et ses environs* (Paris), 1920.

N.S.D.A.P., abbreviation for *National-socialistische Deutsche Arbeiter-Partei*, or Ger. Workers' party. See NATIONAL SOCIALISM.

Nu, Nun, in Egyptian mythology, father of the eight unct. cosmic gods of Egypt at Hermopolis. A personification of the primeval waters containing the germs of all existence. Out of N., on the first day of creation, rose the sun-god in the form of Khepera.

Nuba, black aboriginal people dwelling in the S.E. quarter of Kordofan, Anglo-Egyptian Sudan, remarkably heterogeneous in physical type and language. They are pagans, living in autonomous groups under the control of their *mek*s and rain-makers and observing the cult of the spirits of the dead. Their prov., the N. Mts., like certain other inland parts of the S. Sudan, is most difficult of access. The numerous rocky massifs, rising sheer from the plain, are covered with thorny scrub and honeycombed with deep and intricate caves, and lie amid the swamps of the Upper Nile and Bahr-el-Ghazal riv. systems. There has been frequent trouble with the N. and various punitive operations in the N. Mts. have been due to one or other of sev. causes or a combination of them, namely, inter-int. feuds and pillaging forays, attacks on Arabs or police or travellers in the plains, and refusal to pay taxes or hand over captives to the gov. Early in 1915 there were protracted operations against the N. *mek*, Feki Ali of Jabel Miri, who only surrendered in Nov. of that year. The problem of the rifles held by the N. in their mt. fastnesses is a difficult one and, it is said, will be solved only by time and the exclusion of all material that can be used for the making of gunpowder. In 1928, in order to facilitate administration, the N. Mts. prov. was amalgamated with Kordofan. See Sir H. MacMichael, *The Anglo-Egyptian Sudan*, 1934. C. G. and B. Z. Seligman, *Pagan Tribes of the Nilotic Sudan*, 1932; and S. F. Dadel, *The Nuba: an Anthropological Study of the Hill Tribes in Kordofan*, 1947.

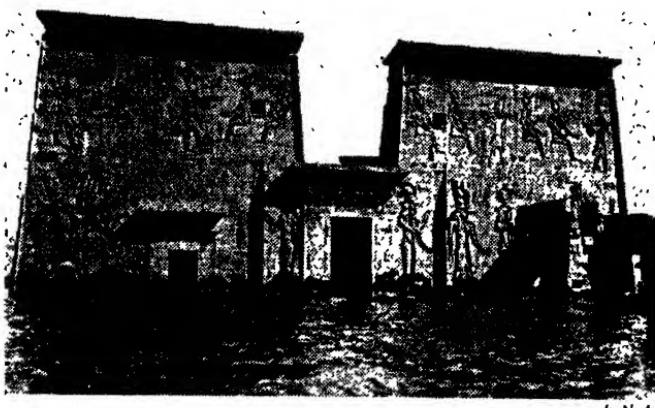
Nubeculae Major and Minor, see MAGELLANIC CLOUDS.

Nubia, tract of country, with no precise limit, in N.E. Africa, anolently known as Ethiopia, and, broadly, lying between Egypt and the Gezira area. The ancients gave the name of Ethiopia to the W. bank of the Nile, from Meroë to the bend of the riv. The name may have been derived from the Egyptian and Coptic *Noub*, or *Gold*, a name still retained in Wady Nouba, which extends from the frontier of Dongola, north of the Wady Soboua, above Derr. The tract between Seboua and Aswan is called the Wady Kenous. Diocletian removed hence Libyan tribe, called Nobate, to the dist. above Syene to oppose the Blemyes, who inhabited the W. desert, now held by the Abahde and Bisharein Arabs. The modern inhab. of N. consist principally of Arabs, who invaded the country after the rise of Mohammed, and merged with older races, the prin. tribes being the Djowabere and El Gharbye, who inhabit from Aswan to the Wady Halfa.

An Egyptian Gov. expedition of 1931, which was led by W. B. Emery, excavated the fifth- and sixth-century tombs of the Blemyes, at Qustul and Ballana.

It seems that in the fourth millennium B.C. N. had been inhabited by a people identical with those of Egypt, lacking Negro characteristics and resembling the Temchu, or Libyans, of the W. desert. Later the Libyans tended increasingly to settle in N. on the W. bank of the riv. By about 2000 B.C. the fusion of these races had produced a pop. resembling that of to-day in physical characteristics, while the rulers of Egypt had estab. garrisons and colonies in what is now Dongola prov. Under Sesostris, Pharaoh of the twelfth dynasty, Kerma was rebuilt as one of the chief administrative centres of N. and it remained so till its destruction in 1600 B.C. About 950 B.C. Libyans obtained

But final disaster overwhelmed Meroë about A.D. 350 at the hands of the Ethiopian king of Axum. From the third to the sixth centuries, when it was converted to Christianity, the S. part was a pagan and independent Nubian kingdom: it had been settled by the Blemmyes who inherited a great part of Meroitic culture. Northern N. became converted to Christianity in the sixth century and a form of Christianity based on the foundations laid by Julianus and Longinus remained the official religion of N. until superseded by Islam 700 years later. It was probably in the sixth century that the tn. of Dongola was founded and made his cap. by Silko, a convert who styled himself 'prince



E.N.A.

NUBIA: THE TEMPLE OF ISIS PHILAE

A photograph taken after the creation of the Aswan Dam, which caused the partial submersion of the island and its famous buildings.

control in N. and there founded an independent monarchy with its centre at Napata, near the holy hill of Barkal (in Dongola). Kashta, a Libyo-Sudanese, in the eighth century conquered Egypt as far as Thebes. In 660 B.C. a Nubian king reoccupied the Delta, but soon afterwards was driven out by Assurbanipal, and in 654 B.C. the Nubian dynasts had withdrawn beyond the cataracts. There they consolidated their power and for three and a half centuries the Napatan kingdom prospered from the swamps of the White Nile to the Aswan cataract. About 300 B.C. the sovereignty passed to Meroë (q.v.). The appearance, shortly before the beginning of the Christian era, of the Rom. legions in Ethiopia ended in the destruction of Napata (23 B.C.) and henceforth the two kingdoms of Napata and Meroë were again reunited under the rule of Meroë after a period of internecine strife in Ethiopia during which the ruling house at Napata had regained some influence.

of the Nubians and all the Ethiopians'. In A.D. 641 the ruler of Egypt sent 'Abdulla ibn Sa'ad with 20,000 men to invade N., but they made no great advance and soon returned. A few years later 'Abdulla, as governor of Upper Egypt, again invaded N., destroyed Dongola, and concluded a treaty with the Nubians which subsisted for some 600 years of varied observance. About the middle of the ninth century the period of Arab domination in Egypt ended and the Mamelukes (q.v.) usurped power. The immediate result was that large numbers of Arabs migrated southwards and settled among the Nubians and north of Halfa they won over a proportion of the Nubians to their faith but further S. they made no impression. Little more is recorded of N. until, about A.D. 1200, it was visited by Abu Salih, the Armenian, who found that it contained seven bishoprics, including one at Dongola. But under Beybars, the Mameluke imperialist, N. was laid waste.

Henceforth it could offer but little resistance. The encroachments of the Arabs increased each year. Sultan after sultan sent armies to capture slaves and plunder. The Christian barrier set up in the sixth century now finally crumbled before the Arab hordes. In the thirteenth, fourteenth, and fifteenth centuries the northern and central regions of the Sudan fell to the Arabs, and those of the older inhabitants, who were not forced into the S. fastnesses became merged with the Arabs, thus evolving the characteristic type of the present day.

The part of N. between Aswān and Wady Halfa is called Lower N., and is under Egyptian jurisdiction; Upper N. belongs to the Anglo-Egyptian Sudan. The chief attractions of this country to travellers are the numerous temples and other ancient remains of the Egyptians, extending from Philae to the Isle of Argo. These consist of the temple of Isis, in the Isle of Philae, founded by Nectanebo I., and continued by the Ptolemies; the temple of Deboud, built in honour of Amen Ra, by Ataramen, and continued by the Romans; Tafa or Taphis, the modern Kalabshé, built by Rameses II.; the rock temple of Beit el Waliy, recording the conquests of the same monarch; Wady Halfa, built by Osertesen I.; the rock temple of Ibsamboul, built by Rameses II.; Gebel Addch, built by Horus of the eighteenth dynasty; Ibrim, built by Amenophes II.; Amada, founded by Thothmes III.; Ghersheh, Sehoua, and Derrl, built by Rameses II.; Dakkhel, the ancient Pselsis, built by Ergamenes; the Colossus of the Isle of Argo; and the Pyramids of Meroë and Tanquassi. See also ETHIOPIA. See J. L. Burckhardt, *Travels in Nubia*, 1819; E. A. Wallis Budge (ed.), *The Egyptian Sudan*, 1907, and *Nubian Texts*, 1909; Sir H. MacMichael, *The Anglo-Egyptian Sudan*, 1934; J. and A. Hamilton, *The Anglo-Egyptian Sudan from Within*, 1937; R. L. Hill, *A Bibliography of the Anglo-Egyptian Sudan from the Earliest Times to 1937*, 1939; W. B. Emery, *Nubian Treasure: An Account of the Discoveries of Ballana and Qustul*, 1918; and J. Spencer Trimingham, *Islam in the Sudan*, 1949.

Nuble, inland prov. of Chile, immediately S. of lat. 36° S., and crossed by long. 72° W. Wheat, wine, timber, and cattle are produced. Its cap. is Chillan. Area 5485 sq. m. Pop. 243,200.

Nucellus, in botany, the part surrounding the embryo sac in the unicellular ovaries of a plant. The N. is a mass of tissue and the embryo sac embedded in it contains an abundance of protoplasm and a number of small cells. Surrounding the N. are an inner and outer integument or envelopes of ovule.

Nuceria, see NOCERA INFERiore.

Nucleus (Lat. *nucleus*, kernel; cf. *nux*, nut). 1. *Astronomy*: the name given to the central portion of a comet. A bright comet consists of three portions, the star-like N., which fades by insensible gradations into the coma or nebulous haze surrounding it, and the tail, stretching in a direction away from the sun. The nuclei and comas of different comets vary in

luminosity, but it is rarely that they can be separated by the naked eye.

2. *Biology*: A N. is usually a spherical or ovoid body present in most living plant and animal cells, and playing an important role in their activity. The N. or cells of higher plants and animals is bounded by a fine membrane enclosing nuclear sap, and within which is a network, the reticulum, of fine linen threads carrying granules and knots of chromatin. One or more masses of chromatin, the nucleoli, are usually present within the N., and may function as a store from which chromatin can be drawn, or as collections of waste chromatin eliminated during div. Nuclear div. initiates cell div. The chromatin aggregates as chromosomes, constant in number and form for each species of plant and animal. Half of each chromosome passes to each of the two daughter nuclei, thus ensuring equal distribution. Such div. is mitotic. Div. by constriction of the N. is amitotic. In fertilisation the number of chromosomes is doubled by the fusion of paternal and maternal nuclei, so sooner or later in the life hist. a reducing div. occurs, and in this the paternal and maternal chromosomes are segregated, whole chromosomes passing to each daughter N. The N. controls metabolism and cell-wall formation (see CYTOLOGY; HEREDITY). Bacteria and blue-green algae have no organised nuclei.

Physics.—The existence of a 'unit' more fundamental than the atom was revealed by the experiments of J. J. Thomson in 1895, on the conduction of electricity through highly rarefied gases. This unit, named the electron, was found to carry a negative charge of electricity, and was a constituent of every atom. The net charge on a whole atom being nil, it was theoretically evident that there must also be a unit carrying a positive charge of electricity in the make-up of an atom. The products of the spontaneous disintegration of radioactive atoms confirmed this conclusion, for while the β -particles were found to be electrons, the α -particles were found to carry positive charges. The general nature of each and every atom was finally discovered by Rutherford and his collaborators by the remarkable experimental method of firing α -particles into atoms. Approximately 1 in 10,000 α -particles was deviated from this straight course, and the manner of its deviation indicated that it had closely approached the positively charged component of the atom whose existence had been predicted theoretically. Moreover since the vast majority of the 'shots' aimed at the atom were not deflected, it was clear that this positively charged component occupied an exceedingly minute portion of the space taken up by the atom, and that the atom consisted very largely of empty space. Exact computations led to the conclusion that every atom consists of a minute though relatively massive N. carrying a positive charge, and performing the function of the sun of a solar 'system' in which the planets are the electrons revolving rapidly in their distant orbits. Since the atom

as a whole is neutral, the positive charge on the N. is exactly equal to the sum total of the charges on the planetary electrons. Further the chemical and physical properties of an element were shown to depend on the charge on the N. of its atom. Evidence provided by the disintegration of radioactive atoms, supported by further experiments of Rutherford and Blackett, led to the conclusion that atomic nuclei had a complex structure. By bombarding nitrogen atoms, for example, with α -particles, Blackett showed that it is possible to break up these nuclei, that they then emit protons (positive units of electricity) and electrons. Later work showed that other atoms emit neutrals - particles which are electrically neutral, and have masses nearly equal to those of protons. The simplest atom, that of hydrogen, has a N. consisting of one proton, round which a solitary electron revolves in a distant orbit. The next lightest atom, that of helium, has a N. consisting of two protons and two neutrons; it thus has a net positive charge equal to that of two protons, so that there are two planetary electrons. The heaviest known atom, that of uranium, has no fewer than ninety-two electrons describing orbits round a N. having a net positive charge equal to that of ninety-two protons. Now the mass of an electron is very small, being about $\frac{1}{45}$ of the mass of the proton. Hence the mass of an atom is largely concentrated in its N., and it might appear from the above that the helium atom would have four times the mass of the hydrogen atom; that the mass of any atom would be a simple multiple of that of the hydrogen atom. This is only approximately true, and the explanation of this apparent anomaly is foreshadowed by the recollection of the fact that there is a third product of the spontaneous disintegration of the nuclei of radioactive atoms, viz. γ -rays. The theory of relativity teaches that radiation, too, possesses mass, so that the nuclei of radioactive atoms lose mass in three ways: by the loss of a β -particle (or electron), by the loss of an α -particle (now known to be the N. of a helium atom), and by the emission of γ -radiation. Similarly the fact that the mass of any atom is not a simple multiple of the mass of an hydrogen atom is explained (as Jeans put it) by the presence of 'a third ingredient which we may describe as electro-magnetic energy. We may think of this, although with something short of absolute scientific accuracy, as bottled radiation.' As is shown by their radioactivity certain types of atomic nuclei are unstable, and disintegrate spontaneously with the emission of a relatively light component such as an electron or α particle. A few of the heaviest nuclei (e.g. those of uranium) disintegrate in a different way when bombarded by neutrons, breaking down into a few parts with roughly equal masses. These processes of nuclear fission lead to the release of much greater amounts of energy than do ordinary radioactive changes, and have been used in atomic bombs: they may in the future

provide an important source of energy for peaceful uses as well. See also ATOM AND ATOMIC THEORY; ATOMIC BOMB. See E. R. Rutherford, Sir J. Chadwick and C. D. Ellis, *Radioactive Substances and their Radiations*, 1930; and E. da C. Andrade, *The Atom and its Energy*, 1947.

Nudd, or Ludd, deity of the Brit. Celts, confounded in later times with a legendary Brit. king of the same name. Tradition has it that his temple stood on Ludgate Hill in London and that he was worshipped chiefly at Lydney in Gloucestershire, where the remains of another temple to him have been found with inscriptions mentioning him by name. His Irish equivalent is Nuada Argetlam (N. of the Silver Hand).

Nuddea, see NADIYA.

Nueces, riv. of Texas, U.S.A. It rises in Edwards co., and flows into Corpus Christi Bay, gulf of Mexico, after a southerly and south-easterly course of 315 m. It contributes largely to irrigation, draining an area of 19,000 sq. mi.

Nuer, tribe of the Nilotic sub-racial unit known as the Nilotes (q.v.). The N. inhabit the swamp region on both sides of the White Nile S. of its confluence with the Bahr-el-Ghazal, and their ter. estimated at 26,000 sq. m. in area, lies between that of the Shilluk (q.v.) and that of the Denka (q.v.) in the Upper Nile Prov. of the Anglo-Egyptian Sudan. The N. pop. is about 450,000 and is prone to inter-tribal feuds. In 1917 Brit. troops were sent into the N. country, as well as against the Dinka. In Feb. 1928 the N. took to the swamps but were bombed out by the R.A.F. and surrendered. After this the Brit. authorities abandoned punitive patrols, and concentrated on road construction, the creation of a neutral zone between the N. and the Dinka, and the provision of various civilising influences such as dispensaries. The solidarity of the tribe is secured by its clan organisation (see on this under NILOTES) and a clan often gives its name to an area. N. life depends on cattle camps (*wees*), consisting of a nucleus of the dominant clan (*dyel*) owning the area around which is gathered a host of strangers (*rul*), i.e. folk who are not members of the *dyel*, often husbands of the women of the clan who have not left the home of their fathers on marriage. Since marriage with a clansman is not allowed, girls must marry a stranger or a member of the Denka tribe. Children of these marriages grow up in the maternal grandfather's home; hence their descent is traced through their mothers (on the kinship system of the Nilotes generally see under NILOTES). The N. differ from the Denka in their social-political organisation; there is no 'divine' king or rainmaker, but, instead, a *kuor muon* or land chief who gives judgment on disputes, in collaboration with the old men of the clan, and awards compensation to the injured party. Rain-making among the N. is of far less ritual importance than among either the Shilluk or the Denka. Forehead scarring is, however, important; incisions are made on a scale not found in

the other peoples and have much greater social significance. In their religion, Kwoth is the name for God, who is associated with the firmament, but the word also denotes any spirit except 'ghost.' When the 'sons of Kwoth' or 'sky-spirits' enter into a man he becomes a prophet (*puk*). These sky-spirits are associated with certain natural phenomena or human relations in much the same way as the gods of classical or Norse mythology, if with less subtlety. Thus Deng, much the most powerful, is associated with sickness, Wu with war, Col with thunder and lightning, Mabith with hunting, while the W. N. have adopted Nyakang (*q.v.*) of the Shilluk as a son of Kwoth, having powers over fish. See H. C. Jackson, 'The Nuer of the Upper Nile Province,' *Sudan Notes and Records* (vi.), 1923; E. E. Evans-Pritchard, *Witchcraft, Oracles and Magic among the Azande*, 1937 (accounts of his expeditions to and work among the tribes of the S.W. Bahri-cl-Ghazal, including the N.); and C. G. Seligman and Brenda Z. Seligman, *Pagan Tribes of the Nilotic Sudan*, 1932.

Nueva Esparta, state of Venezuela, comprising Margarita and other isls. There are pearl fisheries. Cap. La Asuncion. Pop. 69,200.

Nueva Laredo, port of entry into N. Mexico, on the Rio Grande, opposite Laredo, Texas. Cattle and cotton are raised in the dist., and some industries, including cotton textiles and soap-making, are carried on. Pop. 29,000.

Nueva Leon, state of Mexico in the N. part of the republic, stretching from the Amer. border, 300 m. S., to the tropic of Cancer. It is practically all mountainous. Monterey, the cap., is a city of some 185,800 inhab., entirely surrounded by mts. From Monterey there is a railroad to Laredo, another to the port of Tampico, and another to Matamoros on the Amer. frontier. The natural resources are silver, lead, copper, gold (in small quantities), and oil (not yet developed). Manufs. include beer, iron and steel, glassware, furniture, cotton goods, shoes, and enamel ware. Area 25,134 sq. m. Pop. 541,100.

Nueva San Salvador, see SANTA TECLA.

Nuffield, William Richard Morris, first Viscount (b. 1877), Eng. motor manufacturer and philanthropist, b. at Worcester, and educated at Cowley vil. school, near Oxford. He began business as a cycle-maker and repairer in a shed at Cowley, and later made motor-cycles. N. built his first motor-car in 1911, and, a year later, opened a car factory. The first 'Morris Cowley,' assembled not many years before the First World War, was a challenge to the whole Brit. motor market. At that time Brit. motor-cars were not in favour, almost the only reliable machine being a monopoly of the rich. Morris (as he then was) cut his selling price and offered a dependable car at £165. To do this he had to open a new factory, at Cowley, which had now become a township housing hundreds of his employees. The First World War brought a temporary halt to the enterprise, and, in that period, N. made mine-sinkers. After the war he

made cars on mass-production principles. By 1925 the Cowley works were producing 50,000 cars annually. In 1938 the factories covered 120 ac. and employed 16,000 persons. Just before the Second World War N. celebrated the sale of the millionth Morris car. His business was expanded by the purchase of the assets of Wolseley Motors Ltd. for £730,000 in 1927 and by the absorption of the Riley business. His success has been phenomenal, and he will be remembered also as a philanthropist. By 1938 he had given £11,500,000 for research, education and charity, including £3,128,000 to Oxford Univ. alone, where he founded four medical professorships in 1937. Subsequently he made a gift of no less than £10,000,000 to found one of the biggest charitable trusts ever conceived. This, the N. Foundation, will derive an ann. income of £400,000 to be devoted to medical research, the development of medical and health services, trade and industrial research, social studies, and the care and comfort of the aged. By 1943 he had presented out of his private purse something approaching £28,000,000. He was created baronet in 1929, baron in 1934, and viscount in 1938, and received honorary M.A. and D.C.L. degrees from Oxford Univ.

Nuffield College, research college of Oxford Univ. endowed by Viscount Nuffield (*q.v.*) on Oct. 8, 1937. His offer of that date was to found a college 'to encourage research especially, but not exclusively, in the field of social studies, and especially by making easier the co-operation of academic and non-academic persons.' The offer was accepted by the univ. and the terms of the deed were embodied in a statute approved by Congregation on Nov. 30, 1937. The college is under the control of the Hebdomadal Council and comprises full-time official fellows conducting research, faculty fellows already holding offices in the univ. or the colleges which would qualify them to assist in its work, and visiting fellows competent to further its researches by virtue of their experience in the professions or in industry or commerce. In addition there are a number of resident post-graduate students receiving emoluments when in need of them. Apart from All Souls, N. C. is the only college in Oxford which is not primarily for teaching. Lord Nuffield also provided the site, a central one facing the castle mound and fronting New Road. One of his incidental aims in giving the site and benefaction was to save for worthy use the only site then still available within the limits of the old city. It will fill part of the gap between the older colleges of Worcester and Pembroke. The outbreak of war prevented building and the college therefore rented houses in Banbury Road and Woodstock Road. The new building, begun in 1948 and designed by Harrison, Barnes, & Hubbard, is in the Cotswold Gothic style and is to be built of Clipsham stone. The whole design is to be built by stages. The first stage is the building of the warden's house, which, however

will be used temporarily to house the college.

Nugent, James (1822-1905), Eng. philanthropist, b. at Liverpool. In 1872 he founded the Catholic Total Abstinence League of the Cross, which had many branches both in this country and America. He also estab. the 'Save the Boy' refuge and a Magdalene home.

Nugent, Sir Richard fifteenth Baron Delvin (1583-1642), Irish nobleman: took part in the rebellion of Tyrone and Tyrconnel (1605). He was imprisoned in Dublin but succeeded in making his escape. He was subsequently pardoned by James I. and created earl of Westmeath (1621).

Nulchwang, see NEW-CHWANG.

Nuisance, comprehensive term in law. Though it is not difficult to say what acts or omissions in practice constitute a public or common N., and render the offender liable to criminal proceedings, it is by no means easy to say exactly when an act or omission will amount to a private N., so as to ground a civil action at the instance of an individual. In principle the distinction between public and private Ns. is not one of kind, but depends rather upon the extent of the operation of the evil, and it is for a jury to say whether a sufficiently large number of people are or may be affected so as to render a N. criminally punishable. The difficulty of determining in any individual case whether an act amounts to a private N. arises from the fact that private Ns. for the most part concern one's control or enjoyment of land or house property, and neither judges of fact nor juries are disposed to curtail the liberty of the subject by construing as a N. an act which is incidental to or arises out of the carrying on of an otherwise legitimate business. A public or common N. is an act or omission which disturbs or is liable to disturb the normal state of order and comfort of the public. Public Ns. are indictable (see INDICTMENT) as misdemeanours, but will also form the ground of a civil action at the instance of any one or more persons who can prove that they are peculiarly aggrieved or affected in some way over and above the annoyance caused to the public at large. The chief classes of public Ns. are: (1) The carrying on of offensive or dangerous trades or manufs. In these cases it must be shown that the trade or manuf. in the way it is carried on is so offensive to the senses of smell and hearing as to detract sensibly from the enjoyment of life and property in its neighbourhood. (2) Ns. to highways, bridges, and public rvs., e.g. pitching rubbish on to a road, polluting a rv. with factory refuse, causing riotous crowds to assemble, etc. (see also HIGHWAYS). (3) Disorderly houses, gaming and betting houses, unlicensed or improperly conducted playhouses. (4) Lotteries (q.v.). (5) A large and heterogeneous number of acts empirically referred to the class of Ns. by various judicial decisions, e.g. eavesdropping, keeping a corpse unburied if the defendant can afford the burial, publicly exposing persons afflicted with infectious diseases.

Private Ns. include *inter alia*: (1) Acts derogating from the enjoyment by an owner or occupier of land or house property of which he is actually in possession, e.g. flooding by the diversion of a watercourse, undermining by excavation. (2) Acts amounting to obstructions of rights of way or other easements or rights over the property of others, e.g. unlawfully enclosing a common, putting a gate across a public footway. (3) Acts amounting to a continuous interference with the health or comfort of another in the occupation of his property. It is to be noted that a person is not debarred from a remedy by reason of having 'come to the N.' though the question whether comfort or convenience is in fact materially interfered with will depend partly on 'the character of the neighbourhood and the pre-existing circumstances' (*Pollock, On Torts*); but the plaintiff may well have disentitled himself by long acquiescence.

The prin. and most effective remedy for a private N. is the injunction (q.v.), to the claim for which may be added a claim for damages. Abatement, or self-redress, though often successfully carried out in the case of obstructions to highways, is both hazardous and unsatisfactory. In the case of a public N. a local sanitary authority can require the offender to abate the N. within a specified time, and, if he omits to do so within the period allowed, can not only itself abate or remove the N., but recover expenses and penalties from the offender. See Pollock, *On Torts* (14th ed.), 1939; Salmond, *Law of Torts* (10th ed.), 1945; Wintfeld, *Text-book of Law of Tort* (3rd ed.), 1946; and Clerk and Lindsell, *Law of Torts* (10th ed., 1947); and also Steer, *Law of Smoke Nuisances*, 1938.

Nukha, tn. of the Azerbaijan S.S.R. 60 m. N.E. of Kirovabad. The breeding of silkworms and a silk industry are carried on. Pop. (Tatars and Armenians) 25,000.

Nukualofa, tn. on the N. coast of Tongatabu Is., cap. of the Friendly Is. Pop. 3000.

Nulla poena sine lege, i.e. no penalty can be imposed on a person found guilty of a crime unless it is explicitly provided for by law. This legal principle and its correlative, *nullum crimen sine lege* (no act is a crime unless it is so defined by law), were applied in the consideration of atrocities committed by the central powers during the First World War and of new crimes which science made possible, committed by belligerents, during the Second World War. See under CRIMES, WAR.

Nullification, in the hist. of the U.S.A., a term used to denote the action of a state for rendering null and void any Act of Congress, or Federal Act, regarded by the state as unconstitutional. The application of the doctrine of N., or, more fully, N. and secession (i.e. from the Union), received its strongest expression in S. Carolina in 1830, during the agitation against the notorious Tariff Act of 1828, which imposed excessive duties on raw material and imported manufs., and

which has ever since been known as the 'Tariff of Abominations.' The S. Carolina 'Nullifiers,' having obtained no relief from Congress up to 1831, inaugurated a campaign for the calling of a state convention to nullify the tariff. This policy at once split the whole country into two factions—the 'Nullifiers,' or 'the State Rights and Free Trade Party,' and the 'State Rights and Union Party.' Congress then made various concessions by amending the Tariff Act. But the antipathy between N. and S. was too deep to allow the Nullifiers to win in the long run, and later a compromise was effected and the Ordinance of N. repealed. The doctrine of N. is no longer a rated principle. The civil war settled for all time the right of a state to withdraw from its contract with the Union. See *The Cambridge Modern History*, vol. vii., 1905.

Nullity of Marriage. A decree of N. of M. may be petitioned for by a man or woman on any of the following grounds: the fact of a former undissolved marriage; impotency of either of the two parties; relationship of the parties within the prohibited degrees of affinity; marriage without licence or pub. of banns; force, fraud, or mistake; wilful refusal to consummate; venereal disease or pregnancy by some third person existing at the time of marriage on the part of the person against whom the decree is sought. In the 1949 Convocation of Canterbury the Lower House suggested a commission on the law of N. The archbishop of Canterbury thought there was a need for such a commission to review what had become a complex and confused situation, both as to the eccles. and the civil law, and that it would be of benefit to the Church and possibly to the State to have a commission of persons skilled in theological, canon, and civil law, together with people with medical knowledge, to study all the issues involved.

Numania, anct. tn. of Spain, in Hispania Tarraconensis. It commanded a position of great natural strength, being situated on a steep hill. In 134 B.C. it was besieged by the Romans, under Scipio Africanus the Younger, and for fifteen months it resisted famine and the sword, when it surrendered. The tn. was razed to the ground, and the few survivors were sold as slaves. The title 'Numantius' was given to the victor Scipio. The vil. of Guaray marks the site of the anct. tn. Excavations of 1905-10 revealed the entrenchments of Scipio.

Numa Pompilius, second king of Rome, who belongs to legend and not to hist. He was a native of Cures in the Sabine country, and was elected king one year after the death of Romulus. His reign is supposed to have lasted from 715 to 673 B.C. He was instructed by the *camena* or water-nymph Egeria, who visited him in a grove near Roine, and who honoured him with her love. It was he who first appointed the pontiffs, the augurs, the flamens, the vestal virgins, and the Salli. He founded the temple of Janus, which remained always shut during his reign.

Number of the Beast, see APOCALYPTIC NUMBER.

Numbers, see NUMERALS.

Number Sequences, see SERIES.

Numbers, The Book of, forming the fourth book of the Hexateuch (*q.v.*), deals with the travels of the Israelites from the second to the fortieth year of the Exodus. It also contains various collections of laws, as, for example, in chaps. v. and vi. The particular institution of the Levites and a treatment of the priestly duties receive much attention (chaps. iii., iv., viii., xviii.). As in the case of Exodus (*q.v.*) the two main lines of narrative are J., E., and P., which generally appear side by side, but are sometimes harmonised. The first ten chapters and the later ones in Levitical regulations are mainly due to P. See commentaries by W. Attersoll, 1618, and L. Elliott-Binns, 1927.

Numbers, Theory of. This science consists of the investigation of the properties of whole or integral N., all incommensurable Ns. being excluded. It may be considered as including the investigation of rational fractions. An idea of the problems confronting the theory may be obtained by considering indeterminate equations. If a given equation contains two or more unknown quantities it is called *indeterminate*, i.e. no definite solution to the equation is possible. This also applies to the case of sev. equations, the total number of equations being less than the total number of unknown quantities contained in them. The problem in the theory of N. is to find every possible solution in which the unknown letters are integers. Sev. interesting properties of integers are proved by this theory. It is easily proved that the number of prime N. is infinite. The problem of finding in how many ways a composite number, i.e. a number which is divisible by N. other than itself and unity, can be resolved into two factors, is solved generally. It also proves that the product of n consecutive N. is divisible by $|n|$, i.e. $n(n-1)(n-2)\dots 1$, thus $20 \times 21 \times 22 \times 23$ is divisible by $|4|$, i.e. $4 \times 3 \times 2 \times 1$. Sev. other important properties are proved, among which Fermat's theorem is perhaps the most important. This states that if p is a prime number, and N is a positive integer not divisible by p , then $N^{(p-1)} - 1$ is a multiple of p . The interest of this branch of algebra is purely theoretical. The data of practical applications of mathematics are in the nature of things only approximate, and thus any solution given in whole N. is of very little interest. The first consideration of the theory probably took place in India, but the first book on the subject was written by Diophantus, the theory sometimes being called Diophantine Analysis. For further reading the most interesting books are Legendre's *Théorie des Nombres*, while the beginner will find a suitable introduction to the subject in such standard works on algebra as Hall and Knight's *Higher Algebra*. For more advanced treatment and extension of the subject to algebraic N. see L. E. Dickson, *Theory of Numbers*,

and for the general principles of number see G. H. Hardy, *Pure Mathematics*.

Numaea, *see NOUMÉA*.

Numerical Aperture, *see MICROSCOPE AND MICROSCOPY, Components*.

Numerianus, Marcus Aurelius, Rom. emperor, was the son of the Emperor Carus, whom he accompanied on his expedition against the Persians. Carus was assassinated in A.D. 283, and N. was elected emperor by the soldiers, but was himself assassinated eight months later, whilst on his way back to Rome.

Numidia (Gk. *νομίδια*, nomads, the land of Nomads), name given by the Romans to a part of the N. coast of Africa, corresponding to some extent with the modern Algiers. It was bounded on the W. by the R. Mulucha (now Moluya), which separated it from Mauritania; on the E. by the R. Tusca (now Wadi-el-Berger), which separated it from the ter. of Carthage; on the S. it reached to the chains of Mt. Atlas. The inhab. of N., as of Mauritania, belonged to the race from which the modern Berbers are descended.

Numerals. A numeral is a sign employed to express a number. It has long been recognised that the N., inaccurately termed 'Arabic' N., which nowadays are commonly used in daily life, are of comparatively recent origin. Counting is nearly as old as speech and the N. are as old as writing. In ant. times, and in some instances down to modern times, each language had its series of N. Thus the number of systems of notation employed was about the same as the number of written languages, and in some cases a single language had sev. systems. The Egyptians, for instance, had three systems of N., respectively for the hieroglyphic (q.t.), hieratic, and demotic scripts. The Gks. had two systems of numerical notation, and the Romans frequently changed their numerical symbols. The great majority of the numerical systems is based on five or some multiple of five, but there are traces of systems based on four (the Nabatæans had a sign for 'four'; the number 'eight,' 'acht,' 'octo' =Sanskrit *as-tav* = 'two fours'); the duodecimal system (which has left its traces in 'dozen,' 1 ft. = 12 in., etc.) combined with five has given the hexagesimal system employed in Egypt and, especially, in Mesopotamia. The Maya and Aztec systems of notation were based on twenty, and curiously enough the Fr. preserve traces of an ant. vigesimal system, perhaps of the Celts, in the numbers *quatre-vingts*, *quatre-vingt-dix*, *soixante-dix*. Nowadays numerical notation is mainly based on ten. In the hist. of the N. five main categories or systems can be distinguished.

The Primitive Pictographic Notation.—The number is given by repetitions of the symbol representing the object in question, e.g. 'five men' is represented by the symbol 'man' repeated five times; this notation system is often found in pictographic documents of N. Amer. natives. Many primitive tribes represent the N. by the repetition of the vertical or the horizontal stroke, 'one' by one stroke,

'two' by two strokes, etc.; such tribes have little need for or interest in numbers of any considerable size. The primitive tribes of New S. Wales have but four numerical words in their vocabulary, 'one,' 'two,' 'three,' and 'many.' In various primitive forms of speech the number five is expressed by the word 'hand' or 'the hand finished,' ten by 'two hands' or 'two hands finished.' In some primitive S. Amer. dialects 'all the fingers' means ten; 'all the fingers and toes,' twenty; 'fingers and toes of two men,' forty; 'one of the other hand,' six; 'foot one,' eleven; 'foot two,' twelve; and so forth. In some Eskimo dialects the word 'man' also means 'twenty,' and 'two men,' forty.

The 'Hieroglyphic' Systems of Numerical Notation consisted of repetitions of a single unit, with the use of 'hieroglyphics' for higher numbers, and sometimes introducing the principle of multiplication when repetitions become too many for practical use. In the cuneiform (q.t.) Babylonian system, the numerical notation for small numbers was quite simple; 'one' was represented by a short, straight, vertical stroke, or rather wedge, 'two' to 'nine' by two to nine short strokes, 'ten' by an angle, and 'hundred' by a short vertical wedge followed by a short horizontal wedge. Sometimes 'ten' was represented by a vertical crossed by a horizontal stroke, 'twenty' by a vertical crossed by two horizontals, etc., and the units were represented by horizontal and not vertical strokes. The tens were sometimes represented by circles, and the units by a kind of crescent. In larger numbers, which were not standardised, the vertical stroke also stood for 60, 3600, and in general for 60 to the nth degree. The angle also stood for 10×60 , 10×3600 , etc., i.e. for 10×60 to the nth degree. The value to be taken entirely depended upon the context; 3600 was sometimes represented by a kind of irregular square consisting of four short oblique strokes; the same symbol with a small angle inside denoted (3600 \times 10) 36,000; and with two similar angles, 72,000. (For the Egyptian N. *see under HIEROGLYPHIC, HIERATIC, AND DEMOTIC WRITING, Numbers*). In the ant. Crotan script a stroke represented the unit; a dot, 'ten'; a longer stroke, 'hundred'; a lozenge, 'thousand'; at a later stage the units were represented by upright lines, the tens by horizontals, the hundreds by circles, the thousands by circles with four spurs, and the ten thousands by similar signs with a dash in the middle.

The Chinese had, and still have, various numerical systems. The 'rod' N. are quite simple; the units 1 to 5 consist of one to five vertical strokes; 6 to 9 by one to four vertical strokes with superimposed bar; and the tens by horizontal strokes or by a combination of horizontal and vertical strokes (see Fig. 1a). The hundreds were written like the units and so on. These N. were frequently written in the monogram form (see Fig. 1b). In the present Chinese system there are signs for the numbers 1 to 9 (1 to 3 con-

sisting of one to three horizontal strokes, for 10, 100, 1000, and 10,000. The number 25,647, e.g., may be written either from the top downwards or from left to right, as follows: 2 (10,000s), 5 (1000s), 6 (100s),

final forms of the letters *k*, *m*, *n*, *p*, *s* were respectively used for 500, 600, 700, 800, 900. The Heb. numeral forms now recognised are shown in Fig. 2. The thousands were represented by the same

T	TT	TTT	TTTT	-	=	≡	≡≡	≡≡≡	≡≡≡≡	≡≡≡≡≡	≡≡≡≡≡≡	≡≡≡≡≡≡≡	≡≡≡≡≡≡≡≡
6	7	8	9	10	20	30	40	50	60	70	80	90	

a
b

FIG. 1. CHINESE 'ROD' NUMERALS
(a) numbers 6 to 90; (b), the number 40,431 in monogram form.

4 (108), 7, i.e. the symbol 'two' followed by the symbol 10,000, the symbol 'five' followed by the symbol 1000, the symbol 'six' followed by the symbol 'hundred' and so on.

The Maya and Aztec numerical systems were vigesimal, and they wrote 20 as we write 10, using their characters for '20' and zero. In the Maya system 1 to 4 were represented by dots; 5, 10, 15, by sticks, lines, or bars, and 20 perhaps by the moon. The symbols for the multiples of 20 (400, 3000, 160,000, etc.) are still uncertain; it may be, however, that they had the 'place-value' notation. In the Aztec system 1 to 19 were represented by dots or circles, 20 by a religious banner, 400 (20×20) by a pine tree 8000 ($20 \times 20 \times 20$) by an incense-pouch. The most important feature of the Maya system was their zero, the importance of which was recognised by the Maya many centuries before any other people in the world; this symbol was similar to a shell, having numerous variants. The highest number found in a Maya inscription is 1,841,639,800 days, corresponding to over 5,100,000 years.

The Alphabetical Systems.—The Jews, like the Syrians, the Arabs, and some other peoples, used the letters of their alphabet for numerical symbols, taking the first letter for 1, the second for 2, the tenth for 10, the eleventh for 20, and so forth, the last one (the 22nd) denoting 400. In the Talmud the numbers above 400 are

א	ב	ג	ד	ה	ו	ז	ח	ט	ׁ
1	2	3	4	5	6	7	8	9	10
כ	ל	ב	צ	ס	ע	פ	צ	ר	
20	30	40	50	60	70	80	90	100	

FIG. 2
HEBREW NUMERAL FORMS

formed by composition (500 = 400 + 100; 900 = 400 + 400 + 100); in later times the

letters as the units, sometimes followed by a kind of apostrophe.

The Gks. used the letters of their alphabet for numerical notation in the same

α	β	γ	δ	ε	F	ζ	η	θ
1	2	3	4	5	6	7	8	9
ι	κ	λ	μ	ν	ξ	ο	π	Ϛ
10	20	30	40	50	60	70	80	90
ρ	σ	τ	υ	φ	χ	ψ	ω	ϗ
100	200	300	400	500	600	700	800	900
,α	,β	,γ	,δ	,ε	,F	,ζ		
1000	2000	3000	4000	5000	6000	7000		
					,η	,θ		
					8000	9000		

FIG. 3
GREEK NUMERICAL SYSTEM

way as did the Jews. Since they had twenty-four letters in their 'classic' alphabet, and for a more satisfactory system of N. they needed twenty-seven letters, they retained the anc. North-Semitic-Gk. letters *digamma* (as 6), *koppa* (as 90), and *sampi* as 900. Originally the capital forms were used; at a later stage the minuscule were employed. To distinguish the N. from letters a bar was commonly written over each number (Α), but sometimes the letter was written as if lying on its side (Ϛ). The thousands were often indicated by placing a bar to the left or, in modern Gk. type, as ,α, ,β, ,γ, etc. Thus this Gk. numerical system is as shown in Fig. 3. The myriads (= 10,000s; were represented by M or M¹ (10,000), M² (20,000), M³ (30,000), and so on, or by a special symbol (Ω) superscribed on units.

The Gks. had also the numerical system known as Herodianic (so named after the grammarian Herodianus, late second century A.D., who fully described it) or Attic (it is the only system found on anct. Attic inscriptions) or acrophonic (the initial of the name of the number being used as its symbol), while simple vertical strokes were used for the numbers 1 to 4. Thus Γ (an old form for Π , initial of $\Pi\Gamma\Tau\Tau\Tau$, *pente*), five; Λ ($\Lambda\mathbf{E}\mathbf{K}\mathbf{A}$, *deka*), 10; H ($\mathrm{HE}\mathbf{K}\mathbf{A}\mathbf{T}\mathbf{O}\mathbf{N}$, *hekaton*), 100; \times ($\mathrm{X}\mathrm{I}\mathrm{L}\mathrm{I}\mathrm{O}\mathrm{I}$, *khilioi*), 1000; M ($\mathrm{M}\mathrm{Y}\mathrm{P}\mathrm{I}\mathrm{O}\mathrm{I}$, *myrioi*), 10,000. These N. were frequently combined in ligatures. Tens of thousands were sometimes indicated by dots. Special symbols were sometimes used for fractions, sometimes an accent or a line above the numeral indicated the fraction: as, for instance, v or $v' = \frac{1}{2}$, $v'' = \frac{1}{3}$, $v''' = \frac{1}{4} + \frac{1}{3}$, or \ddot{v} , $v^{\prime\prime} = \frac{1}{2}$.

The Etrusco-Roman Numerals.—The origin of the Etruscan and Rom. N. is still obscure (apart from the N. 1 to 4, which were represented by one to four vertical strokes (I, II, III, IIII)). Etruscan had special symbols for 5, 10, 50, 100, and 500. According to some scholars (e.g. Matheus Hostus, sixteenth century, or De Feis, nineteenth century), they were based on number 5; thus Λ for 'five' would be the inverted form of V , which was derived from the open hand, the fingers with the exception of the thumb being held together; X for 'ten' would be a double V ; fifty would be the 'five' with a vertical stroke, and doubled would represent 100; and a horizontal stroke on the base of the fifty, 500 (see Fig. 4). According to another theory these symbols were based on the decimal system,

I	II	III	IIII	\wedge	X	\wedge	X	Δ
1	2	3	4	5	10	50	100	500

FIG. 4.

ETRUSCAN NUMERALS

X for 'ten' being derived from two oblique lines crossed, 'hundred' being the same symbol with the addition of a vertical line, and 'five' and 'fifty' being the same symbols halved (Fig. 4a). Concerning the origin of the Rom. symbols C (100), M (1000), L (50), and D (500), the most probable theory is that they derive from the Gk. letters *theta*, *phi*, and *khi*, which the Romans did not use as letters but retained as numbers. As to the use of *theta* for 100 we have also early forms (see Fig. 5a), and we may assume that written rapidly with a stylus or a reed pen the circular symbol was left incomplete, and under the influence of the initial of C(ENTUM) ('hundred') it became C. *Phi* (Fig. 5b) became the symbol for 1000 and under influence of M(ILLE) ('thousand') became M. An early form of the Gk. letter *khi* (Fig. 5c) became L for 50. D is generally thought to be merely half of the letter *phi*; it was occasionally written C (see Fig. 5b) and appears very commonly

as D. The Etruscans and the Romans also employed other numerical symbols, but the aforementioned were the most commonly used. The vitality of the Rom. system is astonishing; it was used throughout the Middle Ages, holding its own against the Indo-Arabic N., even

$$\Theta, \otimes, \ominus, \odot = C, C = 100$$

a

$$\Theta, \odot, \Delta, M (clo, \infty, \bowtie, \sim) \\ = M = 1000$$

b

$$\downarrow, \Downarrow, \perp, \perp = 50$$

c

ORIGIN OF THE HIGHER ROMAN NUMERALS

a, 100 from the Greek *theta*; b, 1000 from the Greek *phi*; c, 50 from an early form of the Greek *khi*.

being preferred for the calculation of money accounts, and, of course, it is still in use at the present day, though apparently confined to such purposes as the numbering of chapters in a book, and the chaptering of private statutes to differentiate them from public acts.

The Arabic Numerals.—The expression 'Arabic N.' used for our common system of numerical notation is a misnomer. Moreover the origin of this system is not quite certain. It is, however, generally believed that our common numerical symbols originated in India, that they were carried to Bagdad in the eighth century A.D., and thence found their way to Europe, where they were known, in Spain and in Italy, at least in the tenth century. The Arabs themselves attributed the origin of the 'Arabic' N. to the Hindu and called them *hindasi*. The great Arabian mathematician ('Abū Abdallāh Muhammed ibn Mūsa) al-Huwārizmī, of the seventh to eighth century, wrote a treatise on the *hindī* calculation. Carré de Vaux (*Scientia*, 1917, p. 273), however, suggested that the Arabic word *hind*, or rather *hind*, does not mean 'Hindu,' but is of Persian origin (*end*), meaning 'arithmetic measure, geometry'; the 'Arabic' N. did not originate in India from alphabetic letters (as it is generally believed), but were conventional symbols invented in neo-Platonic schools, and

were used in Persian pre-Islamic schools, whence they passed to Bagdad, on one hand, and on the other hand, to India. But Carré de Vaux is practically alone in holding such view. On the other hand, it must be pointed out that our 'Arabic' N. were not used by the Arabs, who evidently derived their forms from some other source, and in course of time further modified them in some respect (see Fig. 6). At any rate, N. are found in Spain as early as the tenth century; they were called *kurtif al-jubdūr*, 'the dust N.', probably because they were written on the dust *abarus* (see below) instead of being represented by counters. The first European scholar who is definitely known to have employed the new N. is Gerbert, who in 998 became Pope Sylvester III. He went to Spain in 967. The oldest definitely dated European MS. that contains these N. was written in Spain in 976 (see Fig. 6, line 3). The later changes in the forms of N. which took place in Italy may be seen in the same fig. (line 20).

A little consideration will convince one that, however obvious it may be to suggest arbitrary signs for the N. from 1 to 9, the relative positions of such signs according to a decimal, indicates a maturity of thought in calculation that no merely arbitrary system can explain. It will be seen that what to moderns may seem arbitrary is in reality a slow development, starting from a simple if cumbersome principle, and worked out by a gradual and highly ingenuous eclecticism. Lastly, researched by various scholars show that the Hindu system, all-important from the fact that after being improved by Arabian, It., and other savants, it formed the basis of the system now in vogue throughout Europe, though admittedly obscure in origin, is not only clearly of high antiquity, but reveals on inquiry a foundation of still older systems, which began the only obvious mode of constructing symbols of number, viz. by repetitions of a single unit, and developed gradually by the use of zero, and a true denomination for each cipher, determinable on a decimal system. The great problem in these various anct. systems was to keep numbers of different denominations separate; it did not occur all at once even to the subtle orientals to represent units, tens, hundreds, etc., by position, for the use of a sign for zero comes late in the developed Indo-Arabic notation. The independent employment of a zero-symbol by the pre-Columbian Mayas (see above) has no influence on the development of our common notation.

The old method of keeping digits distinct was by means of the *abacus*, or reckoning-board, consisting of balls strung on wires or rods set in a rectangular frame. The abacus was used both by the Gks. and the Romans, and is still used in many oriental countries, especially China, for complex calculations. The movable balls are used as counters to record the steps in an arithmetical operation, and each column or compartment represented a particular value to be assigned to a counter or ball placed or

1	፩	፪	፫	፬	፭	፮	፯	፱	፲
2	፻	፼	፽	፾	፷	፸	፹	፻	፻
3	፻	፼	፽	፶	፷	፸	፹	፻	፻
4	፻	፼	፽	፶	፷	፸	፹	፻	፻
5	፻	፼	፽	፶	፷	፸	፹	፻	፻
6	፻	፼	፽	፶	፷	፸	፹	፻	፻
7	፻	፼	፽	፶	፷	፸	፹	፻	፻
8	፻	፼	፽	፶	፷	፸	፹	፻	፻
9	፻	፼	፽	፶	፷	፸	፹	፻	፻
10	፻	፼	፽	፶	፷	፸	፹	፻	፻
11	፻	፼	፽	፶	፷	፸	፹	፻	፻
12	፻	፼	፽	፶	፷	፸	፹	፻	፻
13	፻	፼	፽	፶	፷	፸	፹	፻	፻
14	፻	፼	፽	፶	፷	፸	፹	፻	፻
15	፻	፼	፽	፶	፷	፸	፹	፻	፻
16	፻	፼	፽	፶	፷	፸	፹	፻	፻
17	፻	፼	፽	፶	፷	፸	፹	፻	፻
18	፻	፼	፽	፶	፷	፸	፹	፻	፻
19	፻	፼	፽	፶	፷	፸	፹	፻	፻
20	፻	፼	፽	፶	፷	፸	፹	፻	፻

D. Diringer

DEVELOPMENT OF THE ARABIC NUMERALS

1. Deva-nagari letters of the second century A.D.; 2, Arabic numerals of the tenth century A.D.;
3. The earliest examples of Arabic numerals in Latin MSS. Escorial Library, Spain; MS. of A.D. 976; 4, Other forms of the Arabic numerals, W. type; 5-8, Arabic numerals, F type (8, modern Arabic numerals, as employed in Arabic script); 9-13, The so-called apices of Boethius of the eleventh and twelfth centuries A.D.; 14, The numerals of John Basingstoke (d. 1252); 15-17, Arabic-Byzantine numerals of the twelfth to the fifteenth centuries; 18, numerals in a MS. from France (now in Berlin), of the second half of the twelfth century A.D.; 19, Numerals in an Italian MS. from Florence of the first half of the fourteenth century A.D.; 20, Numerals in Italian MS. of the fifteenth century.

moved on to it. As soon as distinctive symbols or ciphers are used instead of counters to represent the numbers from 1 to 9, and a sign for zero used, the abacus or any other similar mechanical contrivance becomes superfluous, and the problem of calculation by reference to position is solved. Apparently Europe owes the whole of its modern arithmetic

to the Indians and Arabians, for the decimal system or mode of reckoning by tens through the instrumentality of the zero seems to come from India through the Arabs. Whether the Gks. arrived at the decimal system and the use of position and the zero as the most convenient mode of reckoning, independently of the oriental nations, is apparently unknown. Certainly it seems that the value of position might soon have been suggested to them by the dash which, as shown above, was written on the left of a sign for thousands; at all events it is possible that from this use of the dash or stroke the Gks. began to associate high numbers with position to the left. If then, for example, $7000 + 800 + 40 + 2$ were represented by ζ, ω, μ , and β respectively, it would be a natural step to eliminate the dash and run the four symbols together thus $\zeta\omega\mu\beta$ with a line or vinculum over the top to differentiate from a mere word. However, our common numerical system, improperly known as the 'Arabic N.' is the most simple and the most developed of all other, ancient, or modern, numerical systems.

See F. Wopcke, *Mémoire sur la propagation des chiffres indiens. Journal Asiatique*, I, 1863; D. Friedlein, *Die Zahlzeichen und das elementare Rechnen der Griechen und Römer*, 1869; I. Taylor, *The Alphabet*, 1883; C. Zangezemer, 'Entstehung der römischen Zahlzeichen' in *Sitz.-ber. der Königlichen Preussischen Akademie*, 1887; D. E. Smith and L. C. Karpinski, *The Hindu-Arabic Numerals* (with bibliography), 1911; D. E. Smith, *History of Mathematics* (vol. II., with bibliography), 1925; D. Diringer, *L'alfabeto nella storia della civiltà*, 1937, and *The Alphabet* (2nd ed.), 1949; and C. L. Griffith, *The Story of Letters and Numbers*, 1939.

Numismatics (from Gk. *vōμιστα*, a coin with custodial value, currency), study of coins and currency, has engaged attention since the It. Renaissance, when their historical and artistic value was first appreciated. The stimulus then given to coin collecting resulted in the formation of notable cabinets by many scholars and gentlemen: such national collections as those of France, Austria, and Sweden began as royal cabinets. To-day the study is widespread, both among private collectors and also in public institutions, which emphasise the value of N. in furnishing historical, economic, and artistic evidence. Numismatic societies and journals exist all over the world.

Early coinage sprang from the desire for a more generally acceptable exchange medium than cattle or axes or spits (characteristic of biblical, Homeric, and W. European economies), or knives or cloth (used in early Chinese times), when it was seen that metal (normally copper or silver or gold), exchanged by weight, combined reasonable universality with utility, durability, and beauty. The copper talent (the limit of human burden) quickly emerged as the Gk. unit of weight. But fluctuating metal values, and the

cumbersome nature of weighing out metal in bars or broken fractions, still hampered exchange until (as evidenced by Pollux quoting Xenophanes of Colophon) Lydian kings, c. 700 B.C., revolutionised currency by expressing copper values in small pieces of a more precious metal (electrum), by ensuring centralised control of weight and purity, and by stamping these pieces with a standard design. Ability to dictate the exchange value of distinctively marked metal within a given area is the origin of true coinage.

Peninsular Greece followed suit with silver, its characteristic metal: Pheidon of Argos (c. 670 B.C.) was credited with the revaluation of the old iron spits of the Peloponnese in terms of silver coins struck with the 'turtlo' design at Aegina, a 'handful' of six spits being worth a new silver drachma. The age of colonisation had intensified Gk. trade, which thus increased the need for coinage, and by c. 600 both Corinth and Athens were in a position to strike their own coins. They too adopted the drachma unit, related to the universal talent by the intermediate mina weight (= $\frac{1}{6}$ talent) borrowed from the E., but the price of silver varied owing to differing availability and transport costs, and this caused variety in the weight of the drachma, heaviest at Aegina, lightest at Corinth, and tended to divide the world into rival groups. Most Gk. weight standards were offshoots, in one sense or another, of these original systems, Asiatic, Aeginetan, and Attic-Corinthian-Euboic.

By 500 B.C. many Gk. city states had their own mints, and by 350 Gk. coinage was universally regarded as an important sign of political autonomy. The distribution of the various coinages, in hoards and site-finds, accurately mirrors the main streams of Gk. commerce. Each state adopted a distinctive coin device (an owl at Athens, a pegasus at Corinth (see illus., 3), a barley-car at Metapontum, etc.), with or without an inscription giving the city's name, as a guarantee of weight and purity. The coins were circular in shape, and bore 'types' on both sides, and, though often struck very carelessly, came to display a wonderful degree of skill and beauty, as at Elis (see illus., 2), Amphipolis, and many Sicilian cities. By c. 400 B.C. master engravers were signing their dies.

Soon after 450 B.C. imperialist Athens had tried, with some success, to subject a wide variety of independent mints and standards to her own economic control. A more important attempt was made, at the end of the fourth century B.C., by the Macedonian Empire, which coined great quantities of gold and silver with standard types from mints in Greece, Asia, and the Levant: these bore a royal portrait (e.g. of Alexander the Great) in place of the old city badge. In areas not subject to Macedonia the former idioms continued, the Rhodian and S. It. coinages gaining special importance.

By 300 B.C. a purely Lat. coinage was increasing in central Italy, including Rome, in the form of asses, i.e. cast bars or disks of bronze, originally about 1 lb. in



1, Corinth, silver stater, fourth century B.C.; 2, Elis, silver stater, fifth century B.C.; 3, Rome, silver denarius, second century B.C.; 4, Rome (Caracalla), silver Antoninianus, A.D. 215; 5, Louis le Débonnaire of Germany, silver denier, 814-40; 6, Ethelred II. of England, silver penny, 979-1016; 7, St. Louis of France, silver gros tournois, 1226-70; 8, Florence, gold fiorino, from 1251; 9, Henry VIII. of England, gold angel, 1509-26; 10, Arabic silver dirhem, A.D. 768; 11, Jahangir Khan of India, silver half-rupee, 1619.

weight, with their fractions. Contact with Gk. colonies of S. Italy resulted at Rome in experimental silver coins, struck, and on a Gk. standard; and increasing use of silver led to a new silver-bronze ratio expressed, c. 190–180, in the denarius, worth 10 (and later 16) asses of steadily shrinking weight and size. This coin, which was destined to dominate the coinage of the Rom. Republic and early empire and to father the medieval denier and penny, was soon produced in great volume, at first from the central mint of Rome, later from subsidiary It. mints as well, and finally also from 'travelling' military mints, reflecting the deep economic repercussions of Rome's wars of conquest. In contrast with the multiple coinages of Gk. city states, the Rom. Republic struck a virtually uniform and severely centralised coinage for the Mediterranean area as a whole. Technical control was vested in an ann. board of three moneyers, who at first rigidly respected the original 'types,' head of Roma-Bellona, and the Dioscuri (see illus., 3). But by 100 B.C. moneyers were developing designs which reflected the majesty of Rome by reference to the achievements of its noble families, and from this it was a short step to the personally controlled issues (including gold) of the great war-lords, Sulla, Pompey, and Julius Caesar, the last of whom received the right of portraiture on his coins. Rom. coinage was by now imperial in all but name, and, save for base-metal issues still permitted to local communities, supplied vast dominions with centrally controlled money.

It became openly imperial with Augustus's foundation of the principate (27 B.C.), which involved fundamental reform based on gold aureus, silver denarius, brass sextertius and dupondius, and copper as, struck at various mints, with Lyons and Rome at first dominant. Henceforth it acquired new importance as a flexible imperial gazette, emphasising the virtues of imperial rule by means of rapidly changing 'types' which almost always included the emperor's portrait and titles with some allusion to his policy or achievement (see illus., 4, Caracalla). Inflation, beginning with Nero, and debasement, increasing after A.D. 200, led to economic collapse c. A.D. 250; but Diocletian's economic and monetary reforms (A.D. 296) paved the way to a coinage temporarily stabilised on gold solidus, silver siliqua, and sundry copper denominations: solidus and siliqua survived the economic chaos of the fifth century and became the basis of early medieval currency. Late imperial coinage was struck at a large number of co-ordinated mints, and supplied an area extending from Spain to Asia Minor and from Britain to Egypt; and, though unofficial issues sometimes reflected local shortage or political disturbance, these were not frequent.

The collapse of the W. empire in A.D. 476 left to the invading Franks, Goths, Burgundians, etc., the massive tradition of imperial coinage, which they preserved and adapted. Until c. A.D. 700 the use of

gold in W. Europe continued: later, gold was mainly replaced by silver, as in the Rhineland, Gaul, and Britain, though it was retained at Byzantium, the cap. of the still flourishing E. Empire and the source of a coinage which, remarkable for its Greco-Rom. idiom and for the beauty of its religious types, continued until it was overwhelmed by Turkish power in the fifteenth century, though not before it had decisively affected the medieval coinage of Russia.

In central and W. Europe the virtual disappearance of gold coinage resulted in the medieval system built on the silver denier (see illus., 5, Louis de Debonnaire, emperor of Germany, A.D. 814–40), normal in England in the form of the penny. Early medieval coins in most countries were struck by a wide variety of mints. Their religious idiom was strong (see illus., 6, Ethelred II. of England), though their style was often rough: the inscriptions usually indicated the minting authority, the mint, and not infrequently the moneyer. The Holy Rom. Empire gave universality to the system, which, even when imperial control weakened and the rights of coinage passed to independent authorities (principally, eccles., and civic), remained in general use.

The crusades revived W. knowledge of the Levant and led to a resumption of gold coinage in Europe: to the earlier gold 'bezants' of Byzantium were added the florino of Florence (see illus., 8) and the sequins of Venice, Italy taking a large part in E. contacts. France, Spain, and England (the last with her nobles, ryal, and (see illus., 9) angels) followed suit with gold coinages in the thirteenth and fourteenth centuries: this multiplication of values encouraged the introduction of the Fr. gros tournois (see illus., 7, St. Louis, 1226–70), a silver coin much larger than the denier and imitated in England as the groat, worth four pennies. The development of central European silver-mines and the discovery of the rich deposits of the new world were soon reflected in the profuse issue of the large silver thaler and its derivative family, of which the increased size allowed die-engravers scope for the splendid designs of the Renaissance to replace the austere Gothic idiom. The monarch's portrait became in general a standard requirement on the obverses: the reverses were usually given up to increasingly elaborate heraldic or naturalistic designs, often accompanied by religious inscriptions. Technical difficulties in striking such large coins were overcome by the introduction of machinery from 1560 onwards, adopted in England in 1662, after which time a grained ('milled') or raised edge protected coins against the ovv of clipping.

Emphasis on gold and silver was modified from the seventeenth century onwards by the general development of low-value copper coins for everyday use, especially in France, Germany, and the Netherlands, an example soon followed in England, at first in the form of municipal or private trade tokens (q.v.). The pattern of European coinage continued

without major change in the eighteenth and nineteenth centuries, though momentarily interrupted by the Fr. Revolution and by Napoleon's conquests. After 1814 it was radically altered. The rising price of gold made it unsuitable for further use as a coinage metal, and its place was largely taken by bank-notes (*q.v.*), which had already enjoyed a long hist.; and with the crumbling of monarchies and the rise of dictatorships republican or nationalist types displaced the traditional designs. The Second World War did for silver what the first did for gold, and nickel alloys are now in general use to take its place.

The expansion of the Brit. Empire from the seventeenth to the nineteenth century saw European coinage grafted on to many overseas possessions. The E. India Company's coinage, begun in the seventeenth century, was transformed after 1857 into the imperial coinage of India. Amer. issues, first produced for the New England colonists, lapsed after 1773, to be replaced by the earlier U.S. issues from which, in association with the coinage of Canada (from 1820), the great N. Amer. dollar coinage has developed; the S. Amer. coinages derive more directly from the currency traditions of the invading Spaniards. The nineteenth century saw coinage extended to the W. and E. Indies, Africa, Australia, and New Zealand, and to many colonies, such as Hong Kong; even now many of such issues are produced by the Royal Mint (*q.v.*) in London, which, besides contracting to coin for other govs., has also struck its share of the Maria Theresa dollars that for 150 years have been a traditional currency in N. Africa and the Middle E.

In contrast to the European coinage family, based on the idiom of state sovereignty displayed with the utmost variety of pictorial type and inscription, the immense Moslem group, extending in its time from Spain to Turkestan, is externally one of the most homogeneous in the world. It began in the seventh century A.D., as a religious coinage from which representation of the human figure was excluded; its types consisted only of Arabic inscriptions defining ruler, mint, and date and including certain religious formulae. The spread of the Moslem faith introduced minor variations as Arabic coinages absorbed, or were merged in, other systems, sometimes becoming bilingual (as in the Sassanian series), and sometimes even admitting a pictorial type, as in the zodiacal series of Jehangir Khan in India (*see illus.*, 11). But in general the original form has been strictly preserved. The gold dinar and the silver dirhem (*see illus.*, 10), widespread in the Middle E. and characteristic of early N. European trade routes, developed a tradition of calligraphic beauty alive in Moslem coins to-day. The coinage of India has been in part Moslem and in part Hindu with Sanskrit inscriptions and pictorial designs.

Of the Far E. family Chinese coinage began in remote antiquity. The first round coins, which give a glimpse of an earlier stage of tool- and cloth-money,

were made, by casting (regularly preferred in China to striking), appreciably before the first Lydian or Gk. coins; and the Christian era saw a long-estab. series of pierced circular coins of bronze, the standard Chinese coinage metal. For some nineteen centuries this continued with little change. The coins bore no pictorial representation of the emperors: their ideographs mentioned only mint and denomination. In the twentieth century the series has been Europeanised, being based on a struck silver pictorial dollar of 100 cents. The origin of Jap. coinage was later by sev. centuries, owing to isolation and a simple agric. economy: even after the first copper was produced in the seventh century A.D., the majority of coinage from the ninth to the fifteenth century was imported from China. Afterwards a true Jap. series was developed, based on the gold oban and koban, and from the late nineteenth century has followed the decimal system, in gold, silver, and copper, with traditional pictorial types but no imperial portraiture.

Notice must be taken, finally, of certain quasi-monetary issues which, apart from tokens (*see TRADE TOKENS*) and jetons (*q.v.*), fall outside the class of true coinage. These are mostly pieces of necessity, such as siege-pieces (*e.g.* struck by Charles I. in England) or camp-money (as produced in the Boer War) or purely temporary money (in the form of leather or porcelain or even of postage stamps) to tide over a period of crisis. In addition, many examples survive, side by side with true coinage, of primitive 'commodity currencies' such as sugar, tobacco, tea, or salt. Medals (*q.v.*) have never enjoyed the status of pieces of currency.

The chief public coin collections are as follows: in England, at the Brit. Museum and the univs. of Oxford, Cambridge, and Glasgow; on the continent of Europe, at Paris, Brussels, The Hague, Copenhagen, Stockholm, Oslo, Munich, Vienna, Rome, and Budapest (the disposition of the great Berlin collection, which is now in Russian hands, is uncertain); and in New York. They are fed, partially, by recurrent finds of coins formerly hoarded for safety. The law of treasure trove varies from country to country: in the United Kingdom the Crown claims associated objects of gold and silver for their archaeological or historical value, allocating to the Brit. Museum what is there required and paying to the finder the full antiquarian value of any object thus retained. See also COINS; MEDALS.

For the earliest coinages see W. Ridgeway, *The Origin of Metallic Currency*, 1892; G. Macdonald, *The Evolution of Coinage*, 1916; A. H. Quiggin, *A Survey of Primitive Money*, 1949: for Gk. coins, B. V. Head, *Historia numorum*, 1911, and (ed. G. F. Hill) *The Principal Coins of the Greeks*, 1932; C. T. Seltman, *Greek Coins*, 1933, and *Masterpieces of Greek Coinage*, 1949: for Rom. coins, H. Mattingly, *Roman Coins*, 1928, and (with E. A. Sydenham and C. H. V. Sutherland) *The Roman Imperial Coinage*, 1923—: for medieval and modern coins, A. Engel

and R. Serrure, *Traité de numismatique du moyen âge*, 1891, and *Traité de numismatique moderne et contemporaine*, 1897; M. Comencini, *Coins of the Modern World*, 1937; Wayte Raymond, *Coin of the World* (twentieth century), 1945; for English coins, G. C. Brooke, *English Coins* (reprinted, with supplement), 1949. See also G. F. Hill, *Treasure Trove in Law and Practice*, 1936.

Numismatic Society, Royal, see ROYAL NUMISMATIC SOCIETY.

Nummulites, or **Money Fossils**, genus of Foraminifera, so called from the resemblance of the fossilised shells to small pieces of money. They occur principally in the Eocene, and are abundant in the Bracklesham beds. If heated over a spirit lamp and then dropped into water they split transversely, and display numerous spiral coils which are divided into hundreds of tiny chambers. The side walls of the chambers are usually arranged in such relation to one another that they give the appearance of a series of radii from the centre of the shell. The shells vary from $\frac{1}{2}$ to 2 in. in diameter.

Nummulitic Limestone, Eocene formation, almost entirely composed of nummulites. It is often several thousand ft. thick, and is widely spread over many parts of Central Europe, Asia, N. Africa, and America. It attains an altitude of over 16,000 ft. in W. Tibet, and the pyramids of Egypt are built entirely of it.

Nun (Lat. *nonna*), woman who has consecrated herself to God by vow and who has also bound herself to live in a convent under a certain rule. From the beginning of the Christian Church the existence of women devoted to virginity and religious offices may be recognised, and it is probable that they early joined together in communities. The commonest formula for vows is that binding them to voluntary poverty, chastity, and obedience, to which is sometimes added a fourth concerning the particular task, e.g. education of poor girls, to which they dedicate themselves. The older orders, e.g. Benedictines, take different vows but the difference in practice is slight. Convents are either under the authority of the bishop of the diocese in which they are situated, or they are attached for purposes of supervision to the corresponding male branch of the order, and in this case they are termed 'exempt', i.e. from episcopal control, the ultimate authority for them being the Holy See. Ns. are either enclosed, which means that they never leave their cloister, or unenclosed, in which case they go out to perform works of charity in schools, hospitals, etc.; nearly all modern orders are of this latter type. All Ns. bound by 'solemn' vows are under the obligation of reciting the divine office in choir; but practically all modern orders have 'simple' vows which do not carry this obligation, largely on account of the calls of the work in which they are engaged. See also CONVENT.

Nune Dimittis, or **The Song of Simeon**, canticle which forms part of the office of compline in the Rom., Anglican, and

most of the medieval breviaries. It also appears in the order of evening prayer, where it is placed after the second lesson. The canticle is taken from Luke ii. 29-32.

Nuncio, see LEGATE.

Nuncupative Will, verbal will or oral declaration of one's testamentary intentions before witnesses. In general a will, both in Eng. and Scots law, is totally void unless made in writing. Soldiers or sailors over 14 years of age can dispose of their goods and chattels by a N. W., but since the Navy and Marines (Wills) Act, 1865, a N. W. made by a man in his majesty's naval or marine forces will not be effectual so as to dispose of his wage or other money due to him by the Admiralty, though apparently the Admiralty have a discretion to pay the wages to the claimant under an oral will. It is to be noted that the term N. W. is often applied to an informal written will made by a soldier on active service, such wills generally being valid if sufficiently proved. It is doubtful how far the N. W. of a civilian is valid, but in all cases where effect has been given to such a will, it was satisfactorily proved that the testator at the time of making it was in *extremis*. See also DONATIO MORTIS CAUSA. See Jarman, *On Wills*.

Nuneaton, municipal bor. and mkrkt. tn. of Warwickshire, England, on the Anker, 8½ m. N.E. of Coventry and 97 m. from London, on the Midland Region railway. Its chief buildings are the churches of St. Nicholas and St. Mary the Virgin, the former a handsome church in various styles of architecture and with a square embattled tower and pinnacles. There is sixteenth-century grammar school and a free school (1712); also coal-mines, iron-works and manufcts. of woven worsted articles, elastic, ribbon, etc., and of tiles, sanitary pipes, and glazed bricks. Here was b. the novelist George Eliot (Mary Evans). A nunnery, founded in 1150, gave the tn. its name, and on its ruins was built the church of St. Mary's (1877). Pop. 55,000.

Núñez, or Nonius, Fernan (c. 1470-1553), Sp. writer and teacher, b. at Valladolid. He was a prof. of Gk. at Alcalá and Salamanca Univs. He pub. various eds. of the classics and helped to compile the Lat. version of the Septuagint.

Núñez Cabeza de Vaca, Alvar, see VACA, ALVAR NUÑEZ CABEZA DE.

Nunkiang, prov. of China, in Manchuria. The chief products are wheat, soya-bean, kollang, and gold. Through N. passes the Changchun railway. Cap. Tsitsihar. Area 25,849 sq. m. Pop. 2,407,000.

Nun Moth (*Liparis monacha*), black and white moth known as Black Arches in Britain. It is a great pest in Europe, since its caterpillars destroy tree leaves. Poison dust-spraying from the air has been successfully used.

Nunn, Sir Percy (1870-1944), Eng. educationist, son of E. S. N., LL.D. Educated at Bristol Univ., he taught in secondary schools from 1891 to 1905. In the latter year he was made vice-president of the London Day Training College and

In 1913, prof. of education in the univ. of London (prof. emeritus, 1937). He succeeded Sir John Adams as principal of the college (1922). In 1932 the college was transferred to the control of London Univ. and became the Institute of Education. N. continuing in office as director until 1936. He was president of the Training College Association in 1915; chairman of the education section of the Brit. Psychological Society, 1919; president of the Mathematical Association, 1923; and visiting prof., Columbia Univ., 1925. He also served as a member of the advisory committee of the Colonial Office on education and as a senator of London Univ. From 1923 to 1924 he was president of the Aristotelian Society, and in 1927 he delivered the ann. philosophical lecture to the Brit. Academy on 'Anthropomorphism and Physics.' His pubs. include a report for the Board of Education on *The Training of Teachers in Mathematics* (1912); *Teaching of Algebra* (1914); *Education Reform* (1917); *Relativity and Gravitation* (1923); and *Education: its Data and First Principles* (1920), generally regarded as his best work. The central thesis of his work on the data and first principles of education maintains that the primary aim of all educational effort should be to help boys and girls to achieve the highest degree of individual development of which they are capable, while not undervaluing the just claims of public duty and social service. N. gives much attention to the significance and the value of intelligence tests, and explains the ideas underlying the theory of the tests from the psychological standpoint in an analysis of the concepts of *hormé* and *mnemé* (the use of the term *hormé* embracing the concepts of purposive energy as manifested both in conscious and unconscious behaviour; and that of *mnemé* all the varied phenomena referred to by Samuel Butler to memory conscious or unconscious). On vocational education N. concludes that, if conducted in a liberal spirit, it is permissible but cannot be made universal. On the other hand, 'in its concentration of interest on matters whose social value is evident, in its strong appeal to the practical activities, it contains elements which should, in some form, have a large place in every educational scheme.'

Nuoro, prov. of Sardinia in the centre of the is. and also a tn. in the same prov. Area 2800 sq. m. Pop. (prov.) 210,000; (tn.) 10,000.

Nupe, native kingdom of northern Nigeria, W. Africa, bounded by the R. Niger. It has an area of 6400 sq. m. and a pop. of 326,000. N. is an African community which has maintained its individuality through many cycles of change. Among the factors which have contributed to its solidarity is, primarily, the attachment of the people to the principle of kingship; while a second and centripetal has been the acceptance of the brotherhood of Islam, the creed of the ruling race. N. was one of the emirates formerly included in the Fulani empire of Sokoto. The old cap. was Itabba, which

the explorer R. Lander visited. Another Eng. explorer, Baikie, also visited Rabba, in the time of King Masaba, whose successors, however, were hostile to the Brit. In 1881-82 the R. Niger Company gave material help to the emir of N. in his struggle with rebels, thus inaugurating Brit. control of the destinies of N. and over the riv. tribes generally. But in 1896-97 the company was involved in a conflict with the then Fulani emir of N. and the emir of Ilorin, who were raiding for slaves in the vils. along the banks of the Niger, which were under the protection of the company. Eventually Bida, the new cap., was attacked in 1899 by Brig.-Gen. Lugard (later Lord Lugard), but it was only when he led a larger expedition against N. in 1901 that he succeeded in entering the tn. and installing a new emir, who agreed to recognise the Brit. protectorate and to put down slave-raiding. Bida is a trade centre, and is known for its embossed, if unsubstantial brassware, glass bangles, and kola or *laboshe*. The tn. has a wide central avenue and shady trees and is remarkable for its numbers of blue-robed men, and women with henna-dyed teeth and picturesque head-dress. The products of N. include cattle, rice, guinea-corn, and shea-butter. See A. Burns, *History of Nigeria*, 1929, and S. F. Nadel, *A Black Byzantium. The Kingdom of Nupe in Nigeria*, 1942.

Nuphar, genus of aquatic plants (family Nupharaceæ), of which two are Brit. *N. luteum*, the common yellow water-lily or brandy-bottle, is common in lakes and rivs. It bears large, yellow, strongly-scented globose flowers and both submerged and floating leaves. A drink is prepared by the Turks from the flowers. *N. pumilum*, a much smaller plant, occurs in small lakes in Scotland.

Nuraghe, **Nuragghi**, **Nurags**, are the round towers of Sardinia, of which there are about 3000, and which are of very great antiquity. These towers, which resemble the brochs of Scotland and the talayots of Minorca, are built of various stones, such as granite, basalt, and limestone, and consist of two or three storeys, reached by means of a spiral staircase. Their original purpose is not known, nor is there any existing information as to their builders. See J. Fergusson, *Rude Stone Monuments in all Countries: their Age and Uses*, 1872, and Sir R. Lambert Playfair, *Handbook to the Mediterranean* (3rd ed.), 1890.

Nur ed-Din Mahmud, Malek-al-Ade (1117-73) (surnamed 'El-Shahid' (the martyr) by Mohammedan historians), sultan of Syria, b. at Damascus. He succeeded his father as emir of Aleppo in 1145, and tried to expel the Christians from Palestine. The Christian defeat at Edessa led to the second crusade, but by 1151 every Christian stronghold in Palestine was in his hands. He was defeated by Baldwin, king of Jerusalem, and narrowly escaped imprisonment; later, however, he overthrew the Christian princes of Tripolis and Antioch. In 1169 he overran Egypt, and was created sultan of Syria and Egypt by the caliph of Bagdad.

Nuremberg (Ger. *Nürnberg*), city of Bavaria, Germany, 100 m. N.W. of Munich. It was the commercial cap. of Bavaria, and lies in a sandy but productive plain. Formerly among the richest of the free imperial tns., until the Second World War, it still retained its ant. walls and moat, as well as some of the interesting old gateways, and many of the old towers. The castle (*Kaiserschloss*), picturesquely situated on a rock on the N. side of the tn., dated from about the beginning of the eleventh century, and was a favourite residence of the Ger. emperors in the later Middle Ages. The city also had sev. interesting churches, among the best being those of St. Lawrence (*Lorenz*), the masterpiece of the sculptor Adain Kraft; St. Sebald, with its celebrated shrine consisting of a bronze sarcophagus and canopy; and the church of Our Lady, with the Tucherse altar. Among other public buildings were the Renaissance tn.-hall, the Germanic national museum, which included a picture gallery containing works by Holbein, Dürer, and others, and the municipal library, with about 80,000 vols. and 2000 valuable MSS. The city was an important railway and commercial centre, and the chief market in Europe for hops. The prfn. manus. were fancy articles in metal, carved wood, and ivory, 'Dutch' toys and clocks, lead pencils and hardware. N. was the first of the imperial tns. to embrace Protestantism. It was here that the National Socialist party normally held their ann. congress, when Hitler made it the occasion of his most fulminatory utterances. It was at N. in Sept. 1935 that the Nazi laws against the Jews were enacted.

In the Second World War N. was first bombed by the R.A.F. in the autumn of 1941 and sev. times subsequently, particularly on Aug. 10, 1943, when over 1500 tons of bombs were dropped, and again on Aug. 23 of the same year, and on Jan. 2, 1945. As a result of the war, the old part of N., the ant. walled city, the finest medieval relic in Germany, was all but obliterated. The venerable church of St. Sebald, St. Lawrence, and the Frauenkirche, a trinity of noble churches, were in ruins, as also was the Rathaus. The central square, which had been renamed Adolf Hitler Platz, was found fringed with ruins and mounds of rubble when the Allies entered the city in 1945. The damage was worsened by shelling and further air attack during the final battle. Pop. (1933) 411,000. See C. Headlam, *The Story of Nuremberg*, 1899.

Nuremberg Trial, international trial of major Ger. war criminals following the Second World War, which occupied nine months between Nov. 1945 and Oct. 1946 and ended in the conviction and sentence of most of the surviving leaders of the Third Reich for their part in preparing and waging aggressive war and for crimes against humanity. Long before the war had ended the Allies gave consideration to the perplexing question of the treatment which should be meted out to Hitler and his leading criminal associates and, in the meantime, the International War Crimes

Commission was set up to examine material bearing upon individual war crimes. From the start it was agreed that it was impossible to put on trial and punish the small men for individual crimes and crimes which they were in some cases ordered to commit, unless adequate steps were taken against the big men who had inspired and contrived these enormities in the mass. Some were inclined to argue for the shooting of the Nazi leaders out of hand, but the alternative of a public trial before a bench of judges nominated by the chief allied govs. gradually prevailed, though it was only in the last year of the war that negotiations were begun and completed for a four-power (America, Britain, Russia, and France) pact under which the Nuremberg court would be set up. Hence emerged the charter of the court, a document entirely without precedent, which authorised the tribunal, sitting as a court of criminal jurisdiction, for the trial of those brought before it for breaches of international law and cognate war crimes. The objection raised in some quarters that the course taken involved the condemnation, after the event, of men for acts which had not been declared to be crimes against international law at the time when they were perpetrated was misconceived; for the substantive law that the tribunal applied already existed, e.g. the Kellogg pact, which condemned recourse to war as an instrument of national policy, was a treaty of 1928 and Germany was one of its sixty-three signatories. The defect in the past in these prohibitive provisions of international law had been that there was no court with power to try and to punish the transgressor. It was the creation of the court, not the enunciation of the law, that was the novelty; and few people felt their sense of justice outraged when, on Germany's collapse, the Allies decided to create such a court rather than allow those who were guilty of such outrages against humanity to violate the law with impunity.

The trial was actually opened on Nov. 20, 1945, under the presidency of Lord Justice Sir Geoffrey Lawrence. The tribunal consisted of four members, each with an alternate to act in case of illness or the like, and each contracting country chose its own member and alternate. The accused were Marshal Goering (q.v.); Rudolf Hess, the Fuehrer's one-time deputy (q.v.); Joachim von Ribbentrop (q.r.), Reich foreign minister; Dr. Robert Ley, leader of the Ger. labour front; Alfred Rosenberg, gauleiter of Poland; Dr. Hans Frank, a former governor-general of Poland; Hans Kaltenbrunner, Heydrich's (q.v.) successor as chief of the Ger. security police; Julius Streicher (q.r.), governor of Franconia; Marshal Keitel, chief of staff and commander-in-chief of the Wehrmacht; Dr. Walter Funk, Reich minister of economics; Dr. Hjalmar Schacht, Germany's leading economic and financial expert for many years; Gustav Krupp von Bohlen, head of the Krupp armament works; Adm. Raeder, naval commander-in-chief from 1935 to 1943; Adm. Doenitz (q.r.); Baldur von Shirach, founder of the

Hitler Youth; Fritz Sauckel, responsible for the Reich's total mobilisation and enslaving foreign workers in Ger. factories; Prof. Albert Speer, Reich minister of armaments and war production; Martin Bormann, chief of Hitler's chancellery, and deputy Fuehrer in place of Hess; Franz von Papen, Ger. diplomat; Gen. Alfred Jodl, Hitler's personal military advisor; Baron von Neurath, foreign minister before Ribbentrop became gauleiter of Czechoslovakia; Arthur von Seyss-Inquart, minister of the interior and security in the Austrian Cabinet, and later Nazi commissioner for Holland; and Hans Fritzsche, deputy propaganda minister and a leading broadcaster. Robert Ley committed suicide in prison (Oct. 25, 1945); Krupp von Bohlen's physical and mental condition precluded his trial; Bormann was tried in his absence under the provisions of the charter.

The indictment charged the defendants with crimes against peace by the planning, preparation, initiation, and waging wars of aggression, which were also wars in violation of international treaties and agreements, with war crimes, and with crimes against humanity (*see also CRIMES, WAR*). It charged them with responsibility for the death of 12,000,000 men, women, and children, and in his final speech at Nuremberg Sir Hartley Shawcross, Brit. attorney-general, demanded the death penalty for all the prisoners, whom he said should be held responsible for the deaths of that number of victims. The tribunal was, further, asked by the prosecution to declare a number of named groups or organisations to be criminal within the charter, so that membership rendered the individual member liable to the death penalty. All the defendants were represented by counsel and also all counsel were chosen by themselves. The case against the defendants was opened (Nov. 21) by the chief Amer. prosecutor, Justice Robert Jackson, who said that the crime the tribunal sought to condemn had been so calculated, so malignant and devastating that civilisation could not tolerate their being ignored because it could not survive their being repeated. The trial represented the practical effort of four of the most mighty nations, with the support of fourteen more, to utilise international law to meet the greatest menace of their times—aggressive war. These twenty-two broken men and others created in Germany under the *Fuehrerprinzip*, a national socialist despotism equalled only by the dynasties of the anc. East. . . They led their people on a mad gamble for domination, diverted energies and resources to the creation of what they thought to be an invincible war machine, and they overran their neighbours, bringing in millions of human beings as slave labourers. At length bestiality and bad faith reached such excess that they aroused the sleeping forces of imperilled civilisation which by its united efforts had ground the German war machine to fragments.' The Brit. prosecutors included, besides the attorney-general, Sir David Maxwell Fyfe. The

manner in which the latter discharged his onerous task proved to the world what an effective instrument for establishing truth and exposing falsehood is the Brit. way of cross-examination. Gen. Rudenko was the chief prosecutor for Soviet Russia. The nature of the crimes was such that both prosecution and judgment must be that of victor nations over vanquished foes. Yet if they were the first war leaders of a defeated nation to be brought to trial, they were also the first to be given a chance to plead for their lives in the name of the law. The charter of the tribunal which gave them a hearing was also the source of their only hope. The court did not seek to convict the defendants on the testimony of their foes; there was no count of the indictment that could not be proved by Ger. documents and records and by captured films. Some 403 open sessions of the tribunal were held. Thirty-three witnesses gave evidence orally for the prosecution against the individual defendants, and sixty-one witnesses, in addition to nineteen for the defendants, gave evidence for the defence. A further 143 witnesses gave evidence for the defence by means of written answers to interrogatories. The tribunal appointed commissioners to hear evidence relating to organisations and the tribunal itself heard twenty-two witnesses for the organisations. Much of the evidence presented to the tribunal on behalf of the prosecution was documentary evidence, captured by the allied armies in Ger. Army headquarters, gov. buildings, and elsewhere. Some of the documents were found in salt mines, buried in the ground, hidden behind false walls, and in other places thought to be secure from discovery. The case, therefore, against the defendants rested in a large measure on documents of their own making, the authenticity of which was not even challenged except in one or two cases. Of the twenty-two prisoners present at the trial, only three were acquitted. These were Schacht, von Papen, and Fritzsche. The tribunal sentenced twelve of the accused to death, three to imprisonment for life, and four to lesser terms. The Soviet judge dissented from the acquittals. The Allied Control Council rejected all appeals for clemency by the prisoners and also rejected the plea by Goering, Jodl, and Keitel to be shot instead of hanged. Shortly before he was to have been hanged, Goering committed suicide by taking cyanide in his cell. The remaining Nazis sentenced to death were hanged at Nuremberg on Oct. 16.

The court refrained from declaring three of the groups named in the indictment to be guilty. These were the Reich Cabinet, the S.A. (mass militia of the Nazi party), and the high command. 'In effect' (runs the judgment of the tribunal on this point) 'a member of an organisation which the tribunal declared to be criminal might be subsequently convicted of the crime of membership and be punished for the crime by death. That was not to assume that international or military courts which would try those individuals would not exercise appropriate standards of justice.'

This was a far-reaching and novel procedure. Its application, unless properly safeguarded, might produce great injustice.' The tribunal (under Article 9 of the charter) was 'vested with discretion as to whether it would declare any organisation criminal and the discretion was one to be exercised in accordance with well-settled legal principles, one of the most important of which was that criminal guilt is personal, and that mass punishment should be avoided.' If satisfied of the criminal guilt of any organisation or group the tribune 'should not hesitate to declare it to be criminal because the theory of "group criminality" was new or because it might be unjustly applied by some subsequent tribunals.' It was evidently reasonable to refrain from declaring the Reich Cabinet and the general staff criminal groups. Those were bodies whose essential functions were *prima facie* legitimate. The number of persons involved, moreover, in the general staff and high command, was small enough for the individual trial of implicated officers to serve the purpose more effectively than a declaration of criminality. The indicted members of the general staff and high command were military leaders of the Reich of the highest rank, men who at one time or another had been commanders-in-chief of the three services, their chiefs of staff or officers, like Keitel and Jodl who had held high office in the supreme command. The tribunal found that according to the evidence the planning of such commanders at staff level, the constant conferences between staff officers and field commanders, and their operational technique in the field and at headquarters were much the same as that of the armed forces of all other countries. The formations declared criminal were, firstly, the Leadership Corps of the National Socialist party; secondly, the *Schutzstaffel* and its offshoot the *Sicherheitsdienst*, better known under the initials S.S. and S.D., and, thirdly, the *Geheime Staatspolizei* or Gestapo. The first was the motive force of the whole ruthless policy of aggression, and therefore of all the crimes that followed upon that policy; the second were the assassins who served the brutal will of the tyrants; the third were the spies and torturers. To have voluntarily worn any of their shameful uniforms was therefore an offence in itself. Most of the twenty-two prin. defendants were found guilty, in general terms, as members of the Leadership Corps, but each of them had many and grave particular charges to answer. In legal language, the court held that a criminal organisation was analogous to a criminal conspiracy in that the essence of both was co-operation for criminal purposes. The tribunal rejected the excuse of the Nazi leaders that Hitler was responsible for everything and it rejected the idea that a common plan would not exist because Hitler was the dictator. For Hitler could not make aggressive war by himself; he had to have the co-operation of statesmen, military leaders, diplomats, and business men. When

with knowledge of his aims, they gave him their co-operation they made themselves parties to the plan he initiated. That they were assigned to their tasks by a dictator did not absolve them of responsibility for their acts.' The tribunal in the course of its judgment came to the following important decisions (*inter alia*): continued planning with aggressive war as the objective was estab. beyond all doubt; certain of the defendants planned and waged aggressive war against twelve nations; war crimes were committed on a vast scale never before seen in the hist. of war. They were perpetrated in all the countries occupied by Germany and on the high seas.

In declaring that aggressive war was the 'supreme international crime' for which individual heads of state could not escape punishment by seeking refuge in their sovereign rights the Nuremberg Military Tribunal in effect pronounced the judgment of the world's conscience upon an indictment without parallel in recorded hist. The proposition that 'the principle of international law, which under certain circumstances protects the representatives of a state, cannot be applied to acts which are condemned as criminal by international law,' is perhaps the most far-reaching laid down in the Nuremberg judgment; for it means that henceforth the law recognises no wholly irresponsible rule in the world; and absolute rulers whose acts cannot be challenged in their own countries may yet, in certain circumstances, be arraigned before a court of higher jurisdiction. As to the evidence, it may be said that never previously in hist. has a disintegrating major power, in surrenderring, yielded practically all its state secrets, military, political, and economic from confidential speeches of its leaders down to their secret diaries and private correspondence. After the discoveries at Flensburg, Berchtesgaden, and scores of other minor hiding places, it seems unlikely that any of the important events and developments of Hitler's twelve years' regime will remain obscure or open to conflicting interpretation. But manifestly time will be required to prepare a full official pub., with expert commentaries, on so great a mass of material, and the great lesson in contemporary hist., which the full range of these documents contains, could not be learned at the N. T.; for it was not the task of the tribunal to present to the world an authentic, fully documented account of those twelve years. Its task was to judge and to sentence twenty-two war criminals and pronounce on a number of groups or formations, and the prosecution made use of these documents which happened to be in allied hands only where and when they helped to substantiate particular points in the charges. See also P. de Mendelsohn, *The Nuremberg Documents: Some Aspects of German War Policy, 1939-1945*, 1946; D. M. Kelley (psychiatrist to the prison), *Twenty-Two Cells in Nuremberg*, 1947; and Sir D. Maxwell Fyfe (ed.), *War Crimes Trials*, 1948.

A number of Ger. commanders were

tried in 1948 by a U.S. military tribunal which gave judgment (Oct. 27) in the case of three field marshals, nine generals, and an admiral for alleged war crimes. The judgment, delivered by Judge Young (president) and Judge Harding, quoted at length from the findings of the international tribunal which sentenced Goering and his associates and said that the Amer. tribunal would not fix a general rule, but only determine the individual guilt or innocence of the defendants. Staff officers (continued the judgment) had played an indispensable part in spreading the evil which originated with Hitler and the Nazi leaders, but to find an individual criminally guilty he must have passed the order (the indictments charged the prisoners with carrying out such orders as to execute commissioners or the compulsory recruitment of Fr. labour, etc. etc.) to the chain of command, and the order must be on the face of it criminal. The court observed that there had been some opposition among the military leadership to Hitler's plans, but in spite of their opposition they allowed themselves to be used by him. Among those tried were F.-M. Wilhelm von Leeb, who was commander-in-chief of Army Group N. against Russia until Jan. 1942, when he resigned. He was found not guilty of war crimes against belligerents and prisoners, but guilty of crimes against civilians. The court believed that there was much to be said for him by way of mitigation, especially as no criminal order had been adduced in evidence which bore his signature or the stamp of his approval. He was sentenced to three years' imprisonment, but released immediately; F.-M. Hugo Sperrle, who before 1942 commanded an air fleet operating against Britain and later was deputy for F.-M. von Rundstedt (q.v.) as commander-in-chief in France. He was charged with enforcing the Sauckel decree for compulsory recruitment of Fr. labour, but was acquitted; Gen. Hoth was found guilty of crimes against members of the armed forces and civilians in the E. He passed on the order received from von Brauchitsch to execute commissioners and it was ruthlessly carried out by those under his control. He also co-operated in the killing and beating of civilians. He was sentenced to fifteen years' imprisonment; F.-M. von Keuchler was declared guilty of crimes against belligerents and civilians and sentenced to twenty years; Lt.-Gen. Hermann Reinecke, a member of the Nazi party, convicted of criminal segregation of prisoners of war for 'liquidation' or turning them over to the Gestapo, and Lt.-Gen. Walter Warlimont, who had a big part in bringing out and enforcing the order to execute captured prisoners of war and in plans of incitement to lynch captured airmen, were sentenced to imprisonment for life. Seven other generals were sentenced to terms of imprisonment. Adm. Otto Schniewind, the only naval officer accused at this trial, was discharged.

At the end of Aug. 1948 the Brit. War Office announced that the gov. had decided to bring F.-M. von Brauchitsch,

F.-M. von Rundstedt, F.-M. von Manstein, and Col.-Gen. Adolf Strauss to trial as war criminals by a military court in the Brit. zone of Germany. F.-M. von Manstein was then seventy-six and almost blind: his trial took place at Hamburg (Oct.-Dec. 1949) and he was sentenced to eighteen years' imprisonment. F.-M. von Brauchitsch (aged sixty-seven) died in a Brit. military hospital at Hamburg on Oct. 18, 1948.

Following the first great trial, twelve separate cases were heard by U.S. military courts. The final case was that in which twenty-one Ger. diplomats, civil servants, industrialists, economists, and others, judged by a U.S. military tribunal at Nuremberg, were sentenced to varying terms of imprisonment on April 15, 1949. The defendants at this trial included von Weizsaecker, head of the Ger. Foreign Office during most of the war, sentenced to seven years' imprisonment for assisting aggression in one case and of crimes against humanity; Lammers, head of the Reichs chancery, convicted on all counts, including plunder and spoliation (twenty years' imprisonment); Schwerin von Krosigk, minister of finance, convicted of plunder and spoliation (ten years); Berger, an S.S. (q.v.) general and chief of prisoner-of-war affairs, associated with conscripting children in the E. for labour in Germany and with peculiarly sadistic murders at Lublin of young Jewesses and with the murder of a Fr. general prisoner of war (twenty-five years); Darre, minister of food and agriculture; Pleiger and Kehrl, industrial and economic planners; Rasche, head of the Dresdner Bank; Steengracht van Moyland, Weizsaecker's successor; Kepler, who organised the agency for 'Germanising' E.ers.; Bohle; Wormann; Stuckart, head of the Ministry of the Interior under Himmler; Veesenmayer, who ushered the Ger. regime into Hungary in 1944; Dietrich and others, sentenced to terms varying from four to fifteen years. Two of the three judges found five men guilty of assisting aggression; four of ill treating belligerents; fourteen of offences against civilians; nine of plunder and spoliation; and twelve of being members of criminal organisations. The third member of the court filed dissenting views on six of the convictions. Dealing with Weizsaecker, the tribunal majority found that he assisted in the seizure of Bohemia and Moravia in 1939 in that he stultified all attempts by the Brit., Fr., and even the Its. to frame a joint guarantee with Germany of the independence of what then remained of Czechoslovakia as provided for in the Munich pact (q.v.). Judge Christianson, president of the tribunal, and Judge Maguire declared that 'international law was not statutory and consisted in part of practice and principle. History had proscribed aggression long before the last conflict. The accused were charged under Control Council Law (No. 10) enacted by the Allied Control Council on Dec. 20, 1945, and Article II, section 2, declared that any person who was principal or accessory was guilty of a crime outlawed

by the law. The fact that a person acted under orders did not free him of responsibility for a crime, though it might be considered in mitigation. It was apparent that the success of the Nazi programmes depended largely on the men holding positions of authority in the various government departments.' The tribunal concurred in, and applied the principles laid down by the International Military Tribunal (*see above* in the judgment in the leading trial). The third member of the court (Judge Powers) (who filed dissenting views) held that the guilt of Lemmers, von Weizsaecker, and several others had not been estab. against them personally, but that they had been declared guilty only because they knew of the crimes.

Since the first great trial there were altogether 177 defendants in the dock, apart from those who committed suicide in their cells or were released from trial because of illness. Of these defendants 142 were convicted and 24 sentenced to death by hanging. The prosecution had a staff of 1746 to assemble material and conduct the cases in court, and for the defence 373 Ger. and 2 Amer. lawyers were engaged. Among the defending counsel were 55 members of the Nazi party, 9 members of the S.A., and 3 who held S.S. membership. All the documents collected were sent to archives in Washington.

Nursery Rhymes, Jingling rhymes invented for the amusement of children, or perhaps survivals of ancient folklore, invocations or incantations preserved from remote antiquity. Many of them are without doubt survivals from O.E. May-day celebrations, ring-songs, and dances which were once practised by grown-up people. The jingling metre and doggerel rhymes, in which the sense is often sacrificed to the attempted rhyme, have been handed down orally from one generation of children to another. The verses generally consist of a rhyming couplet or a quatrain in which the second and fourth lines rhyme, and there is frequently a refrain accompanying the quaint old airs which have been handed down as their setting. The nursery rhyme proper, embodying a tale set forth simply, and marked by either wit or pathos, is almost peculiar to the Eng. tongue; the equivalents in the Lat. or Teutonic tongues are more ornate and fantastical. The 'counting-out' rhymes, in which one word is dropped for each player and the one on whom the last word falls drops out from the ring, form a most interesting branch of folklore, and are undoubtedly of great antiquity. See R. Chambers, *Popular Rhymes of Scotland*, 1828; J. B. Ker, *An Essay on the Archaeology of Popular English Phrases and Nursery Rhymes* (new ed.), 1837; J. O. Halliwell-Phillipps, *Nursery Rhymes of England*, 1842; E. Rolland, *Rimes et Jeux de l'Enfance*, 1883; W. W. Newell, *Games and Songs of American Children*, 1884, 1903; Louey Chisholm, *Collection of Nursery Rhymes*, 1911; *Mother Goose's Nursery Rhymes* (Everybody's Library); and L. Derwent, *Nursery Rhyme Anthology*, 1938.

Nursery School. The N. S. in Britain is intended to provide for the healthy physical and mental development of children between two and five years of age. Its purpose is twofold: nurture and education. Welfare centres are concerned with the health of the infant up to the age of two. The school doctor examines the five-year-old when he enters the primary school, but until the advent of the N. S. there was no proper provision in Britain for the 2,000,000 children between the ages of two and five. In 1918 the minister of education, H. A. L. Fisher, attempted to bridge this gap. Realising the serious degree of physical defect apparent in children on their admission to school, he warmly advocated the estab. of N. S. in all areas. During the year ending March 1919 thirteen N. S. were recognised by the then Board of Education. These consisted mainly of voluntary pioneer schools which had been estab. before the passing of the Act. Then came the national call for economy. The N. S. in existence were regarded as costly institutions, and the estab. of further schools was not recommended by the board. Margaret McMillan (*a.v.*), the pioneer of this movement, had long foreseen that the cost of the small school was likely to prove a stumbling-block. She had always advocated the large open-air school, but the authorities had declined to follow her lead, because they feared the spread of infection if large numbers of the 'unprotected' little ones were gathered together, and they considered that ideal home conditions could more readily be realised in the small school. By her experiment at Deptford Margaret McMillan proved conclusively that a large N. S. of 260 children could be maintained at the low ann. cost of less than £12 per child, and that with open-air conditions there is no undue risk of infection. In Dec. 1929 a circular was sent out from the minister of health and the president of the board of education concerning the welfare of the pre-school child. The essentials for healthy development at this age were summed up as follows: open-air conditions, sun and light, exercise and play, rest, food, and cleanliness. The local authorities were encouraged to establish and support open-air N. S. where these needs could be met. During the years before 1939 a number of N. S. were opened up and down the country and some colleges began to offer training for girls who wished to specialise in N. S. work. With the advent of the war, when fathers were called up and mothers urged into industry, the need for N. S. became more urgent. Many wartime nurseries were opened jointly by the Ministries of Education and Health. These catered chiefly for the child of the working mother. Infant schools opened nursery classes for children from three to five years and with evacuation a large number of residential nurseries appeared. In 1944 the passing of the Butler Education Act made it necessary for local authorities to set up N. S. where there was the demand, but in 1947 the building of new N. S. was banned

by the Ministry of Education. In 1945 the minister of education took over 315 of the war-time nurseries and organised them into N. S., but apart from these there have been few N. S., although day nurseries have once more been opened by the Ministry of Health for children whose mothers are working. In 1949 plans for twenty-one new N. Ss. were passed for building, practically all in industrial areas. The high cost of building a N. S. has been considerably lessened by the realisation that N. S. of the shelter type which were advocated by Margaret McMillan are a suitable form of accommodation for young children. To this end the N. S. Association has designed a new building, similar to those first erected in Deptford. A prototype of this design has been built at Cookham and has been taken over by the Berkshire education authority. In view of the greatly reduced cost of building the prototype, other authorities are now planning N. Ss. on similar lines and it is expected that many more will be built in different parts of the country, so helping to improve the present lamentable position, when only 1·10 per cent of British children between two and five years can find a place in a N. S. See Margaret McMillan, *The Nursery School*, 1930; Susan Isaacs, *The Intellectual Growth of Young Children*, 1935; V. Fedaeovsky, *The Nursery School in Soviet Russia*, 1936; and Mrs. P. E. Cusden, *The English Nursery School*, 1942.

Nursing. Sick N. has evolved into a highly skilled profession since the Crimean war. In ancient times there were in existence hospitals, or at least some kind of dispensary system, for the sick poor in Egypt, India, Greece, and Rome. Essentially, however, organised N. as a branch of medical treatment may be said to have taken its rise amongst the deacons of the early Christian Church. From the fourth century on the development of N. was rapid, and the institutions were managed by the clergy, and the nurses recruited from the male and female monastic orders. Throughout the Dark and Middle Ages this system obtained. The oldest institutions in England are St. Thomas's and St. Bartholomew's Hospitals, and their names indicate their religious connection. The Reformation caused a secular system to be introduced. Any measure of systematic N. was not attempted until the middle of the nineteenth century, and until then all the skill that nurses possessed was acquired in the course of their work in the wards. Germany saw the birth of the new system at the foundation of the Institute of Pastor Fliedner in 1836 at Kaiserwerth; and it was at this place that Florence Nightingale was trained. Pastor Fliedner's Institute was soon followed by the formation of societies in Philadelphia (1838) and in London (1840). The latter was founded by Mrs. Fry, and the nurses were trained at Guy's and St. Thomas's Hospitals. Between 1842 and 1851 several schools were formed on the Continent.

The pub. of the horrors of the Crimean war gave a new impetus to the pro-

fession, and raised it considerably in the public esteem. Florence Nightingale with a band of trained nurses undertook the administration of the hospitals, and reformed them, besides nursing the sick. As a result, too, in 1860 the Nightingale Fund Training School for Nurses was founded at St. Thomas's Hospital, with public subscriptions given in recognition of her great work; and all over the Continent similar schools were soon established. During recent years the practice of preventive medicine and the advance of medical science generally have made it essential that nurses should be highly skilled and trained.

Nursing as a Profession.—N. ranks high as a profession for women, since it has an essentially feminine appeal. It gives an opportunity for service, combined with the prospect of professional standing and an assured future with good salary and pension rights. The profession is also open to men. The number of male nurses has increased very considerably of recent years. Training is available to men in a number of general hospitals and mental hospitals, lists being obtainable from the Ministry of Health and the General N. Council for England and Wales.

To train as a nurse it is necessary to possess good health, an even temperament, and a spirit of service. The usual age of entry is between the ages of eighteen and thirty years. Entry to hospital is generally by way of a preliminary training school attached to the hospital, or in the case of the smaller hospitals through a central preliminary training school. This period varies from three to four months, and at its completion the student enters the hospital and continues training in the wards and depts. The length of training varies; in some hospitals it is three and others four years. Three years is the period required by the General N. Council for England and Wales, the statutory body responsible for the training and professional education of the student nurse. This body regulates and sets the preliminary state examination which can be taken in two parts. Part I. (theoretical) may be taken on completion of a pre-nursing course, arranged by many schools, and is taken at the completion of general education and prior to entering the preliminary training school, or at the completion of six months' training in the hospital. Part II. (practical) is taken after twelve months' training. The final state examination is taken at the completion of three years' training. The successful candidate then becomes a state-registered nurse and her name is entered on the register kept by the General N. Council. Many hospitals now give training under a system known as the 'block system of training,' which means that the student takes the theoretical part of training away from the wards; during the time in this school of N. she works entirely as a student, returning to the wards again after a period of about six weeks. Other hospitals have a modification of this system and others have a study-day a week. Many hospitals have adopted a straight

span of duty. The twenty-four hours are split into three spans of eight hours each.

At the completion of training many opportunities present themselves to the state-registered nurse. The post of staff nurse in hospital prepares for greater responsibility and higher posts such as that of ward sister, assistant matron, sister-tutor, and matron. There is the Queen's Institute of District Nurses, for those who like to nurse the sick in their own homes and who like to work from their own home. Private N. appeals to many. At the present time great emphasis is laid on the preventive side of medicine and there is a wide field for work as health visitors, school nurses, and industrial nurses. Interesting work is available with any of the services attached to his majesty's forces (see MILITARY NURSING SERVICE), and in the field of medical missions. Many post-graduate courses are arranged. A diploma of N. can be taken at the univs. of London and Leeds. The sister-tutor's diploma is awarded by the univ. of London. Courses are also arranged for hospital administration, the qualification of health visitors, etc. Training for qualification of midwives is controlled by the Central Midwives' Board. Part I. training qualifies a nurse to act as a maternity nurse, working with a doctor, and Part II. gives the qualification as a state-certified midwife.

Salaries and emoluments are controlled by a Whitley Council and an overall salary is paid, the nurse repaying the hospital for board and residence. The nurse pays a share of the superannuation contribution.

Certain hospitals have training schools (q.v.) for assistant nurses, those who qualify becoming state-enrolled assistant nurses. The nurse's name is then entered on the roll kept by the General N. Council. This training covers a period of two years and is designed for those who cannot take the full training for state registration.

Salaries range approximately as follows:

(1) for a student nurse:

<i>Gross Salary</i>	<i>Repayment to Hospital</i>
First year £200	£100
Second year £210	£100
Third year £225	£100

Male nurses employed in the administrative co. of London receive an additional allowance of £24 14s. per annum; those employed in the Metropolitan Police dist. outside the administrative co. of London, an additional payment of £14. 6s. per annum.

(2) For a pupil or probationer assistant nurse:

<i>Gross Salary</i>	<i>Repayment to Hospital</i>
First year £200	£100
Second year £210	£100

The same allowance as above is paid to male nurses. Slightly higher salaries are paid to those training for mental and tuberculosis N.

(3) Salaries of (a) enrolled assistant nurse; (b) staff nurse (S.R.N.); and (c) ward sister are as follows:

<i>Gross Salary</i>	<i>Repayment to Hospital</i>
(a) £285 by ann. increments of £12 10s. to £385 . . .	£120
(b) £315 by ann. increments of £12 10s. to £415 . . .	£120
(c) £375 by ann. increments of £15 to £480 and further increment of £20 to £500 . . .	£130

Salaries for assistant matron, sister-tutor, and matron are on a higher level and under review at the present time (1950). Salaries for male nurses are approximately £10 per annum higher than above.

The status of the nurse is protected by the Nurses' Bill of 1943, by which Act it is an offence for any person to call herself/himself nurse who is not a state-registered or state-enrolled assistant nurse. The Nurses' Bill, which was before Parliament in 1949, is an Act to reconstitute the General N. Council for England and Wales and otherwise to amend the Nurses' Acts, 1919-45, to establish standing nurse training committees, registration of nurses trained abroad, etc. The professional negotiating organisation for nurses is the Royal College of Nursing. The National Council of Nurses of Great Britain and N. Ireland is an association of affiliated organisations through which the member bodies are affiliated to the International Council of Nurses. The Brit. Red Cross Society and the St. John's Ambulance Brigade arrange for lectures in home nursing and first aid. Members of the detachments are taught practical first aid and N. procedures. These societies have given very valuable help in augmenting hospital staffs most particularly during the two world wars.

Home Nursing.—Treatment of illness or injury in the home, usually by the non-professional, though also by the dist. nurse (see *under Nursing*). With the extension of hospital services in modern times the field of home N. has become more restricted. It is rare for even the simplest operation to be performed in the home. But a knowledge of home N. is still essential for the treatment of minor illnesses or injuries, for the care of more serious cases, both before the patient is removed to hospital or N.-home, and during convalescence. Cases of influenza and sometimes pneumonia, acute infectious fevers such as measles, chickenpox, and whooping cough, and simple digestive disturbances are normally treated at home, as well as chronic cases such as surgical tuberculosis in children and chronic rheumatism and chronic bronchitis in old people. Home N. also embraces the treatment of accidents such as bruises, cuts, burns, and sprains.

Some knowledge of home N. is indispensable in every household, and is particularly necessary in homes where there are young children. Although some knowledge of medicine and hygiene is required, the essential qualifications for home N.

are common sense, sympathy, and resourcefulness. The same qualities of obedience and loyalty which are demanded of the hospital nurse are demanded of the home nurse. If she is sensible and capable she can do much to further the work of the doctor by carrying out his orders exactly and efficiently. Her actions can make or mar his prescribed treatment.

The arrangement of the sick-room is an important part of home N. The ideal situation is in the upper part of the house, since the air is purer and ventilation easier, and in infectious cases an upper room can be more easily isolated. It is normally quieter also, and a room which faces S. or S.W. allows for the maximum amount of sunlight and warmth. Sensible ventilation is an essential aspect of the hygiene of the sick-room, since purity of atmosphere is most important. It is necessary to keep the temp. constant, to avoid draughts, and to arrange for suitable lighting. The home nurse is always careful to avoid overfurnishing of the sick-room, since this would result in the collection of dust and might hamper her movements, but she should do her utmost to make the room as pleasant and cheerful as possible, by the choice, for example, of well-arranged flowers as decorations, which are removed each night.

Much of the art of home N. lies in the ability to adapt skilfully. While the home nurse possesses a number of medicines and bandages she usually lacks the facilities which the hospital nurse possesses, and it is frequently impossible for her to provide the ideal sick-room. She therefore makes the best of the materials available, always taking scrupulous care in matters of hygiene. She cleanses and dusts the sick-room daily, disturbing the patient as little as possible, for the amateur nurse can easily irritate the patient by noisiness or over-attention. Like the hospital nurse and the doctor, the home nurse is concerned with the prevention, as well as the cure, of illness. By isolation, by the routine disinfecting of all objects used in the sick-room, and by the immediate burning of soiled articles such as used bandages and swabs, she can do much to lessen the risk of infection breaking out among other members of the household.

One of the first essentials for the home nurse is to learn the use of the clinical thermometer, to read it accurately, cleanse it properly, and to acquaint herself with the various methods in which the temp. of the patient may be taken and recorded. She performs such duties as bed-making and washing of the patient, and such tasks are best done by using the methods followed in hospitals. A routine knowledge of the methods of changing dressings, of the way to administer drugs, food, and any treatment ordered, at the exact time, in the exact quantity and exactly as ordered, and of the accounting to the doctor of all that has taken place since his last visit clearly and dispassionately are all duties of the home nurse. The greatest care should be given to the dainty

serving of appetising meals and to introducing a measure of variety. The advance in the development of reliable patent medicines has lightened the home nurse's responsibilities in many cases, making only sensible administration, and not preparation also, necessary. The efficient home nurse always possesses a clinical thermometer, a satisfactory stock of the reliable patent medicines suitable for the treatment of the minor ailments such as aspirins, laxatives, burn ointment, etc., as well as supplies of lint, bandages, adhesive plaster, elastoplast, and antiseptics.

While the home nurse's duties frequently consist of carrying into effect the orders of a doctor, she is often called upon to act upon her own initiative in an emergency (but should never hesitate to send for the doctor), and this entails coolness and common sense. Often the home nurse is also a housewife, and is forced to combine the running of a home with the extra task of applying first aid to an injury or N. a sick person for many weeks, and this dual occupation necessitates that she be a person of good health, courage, and method, since otherwise both patient and home may suffer. Her responsibilities are great; to complete a successful convalescence, to deal with the rapidly alternating condition of a feverish patient, or with the changing moods of a sick child, require a person who combines skill with deep sympathy.

The home nurse is usually dealing with patients who are not so ill as those under the treatment of the hospital nurse, and much of her work is connected with restoring her patient's confidence and interest in life, as well as health. She avoids fussiness and is always tactful and optimistic. She coaxes her patient to health, taking care not to give the appearance of bullying or forcing. Her task is complicated by the fact that her patients are usually members of her own family; she has no need, like the hospital nurse, to treat them consciously as individuals. Her effort has rather to be directed in the opposite direction, in the curbing of over-emotionalism, even though her firmness concerns those to whom she is related. The successful home nurse requires many of the qualities of the hospital nurse.

*See A. Millicent Ashdown and Emily Bleazby, *A Textbook of Anatomy, Physiology, and Hygiene*, 1935, 1945; I. Stewart, *Medical Handbook for Nurses*, 1936; E. C. Pearce, *General Textbook of Nursing*, 1937; Agnes E. Pavey, *Story of the Growth of Nursing*, 1937; H. C. R. Dootting, *Elementary Hygiene for Nurses*, 1939; A. Millicent Ashdown, *A Complete System of Nursing*, 1945 ed., and *The Elementary Practice of Nursing*, 1940; D. Taylor, *General Nursing: Questions and Answers*, 1944; W. G. Sears, *Medicine for Nurses*, 1945; L. Oates and T. B. Davies, *A New Dictionary for Nurses*, 1946; E. J. Merritt and I. D. Irven, *District Nursing*, 1949. N. C. Fletcher, *Aids to Home Nursing*, 1927; W. T. Fishbein, *Practical Home Nursing*, 1947; M. H. Miller, *Elementary**

Home Nursing for the Housewife, 1948; and British Red Cross Society's manuals: *First Aid and Home Nursing*.

Nusseerabad, see NASIRABAD.

Nut, Egyptian goddess, one of the great company of Heliopolis, wife of the earth-god Seb. She personified the vault of heaven and is represented as such with raised body studded with stars, and pendant legs and arms, arched over the recumbent figure of Seb. N. was the primeval mother of the gods and mistress of the sky, figured at times as the celestial cow; her children were Osiris, Horus, Set, Isis, and Nephthys. Apparently she is not identical with the N. who was one of the ladies of the sycamore and provided refreshment for the soul before it started its dismal journey after death.

Nut, strictly a fruit, with a woody pericarp which decays to set free the seed or seeds (e.g. hazel, beech, acorn, and Sp. chestnut). The fruit of the horse chestnut is properly described as a berry-like capsule. Most of them are rich in oils and starches, and their value as food has received much attention in recent years. Many nutritious articles of diet, including butter substitutes, are prepared from them. The most important are the coco-nut, brazil, walnut, chestnut, hazel, cashew, and pea-nut. See also GROUND-NUTS. See F. N. Hower, *Nuts: Their Production and Everyday Uses*, 1948.

Nutation is compounded of a number of independent motions of the earth's axis, the most important of which is known as *Lunar N.*, with a period of 18 years 220 days, the time of a sidereal revolution of the moon's nodes. The major and minor semi-axes of the ellipse described are 9·2 in. and 6·8 in., respectively. There is also a *Solar N.* with a period of half a tropical year, and in addition, a *Fortnightly N.* The value of the N., taking all the contributory factors into consideration, can be computed for any star by using certain constants which are given in the *Nautical Almanac* each year for every day of the year. See PRECESSION.

Circumnutation is a term used in botany for the irregular movements of the stem apex.

Nutcracker, or *Nucifraga*, genus of birds of the crow family, *N. caryocatactes*, occasionally visits Britain. It is about the size of a jackdaw, having a brown back, with a long white spot on each feather, dark brown head, white tipped outer tail-feathers, black feet, and a black bill. In flight and habits it resembles the jay. It feeds on fruit, a variety of insects, and also the eggs and young of small birds. The nest is a big, clumsy structure, and in it about three eggs are laid, which are very light green, spotted with pale brown.

Nut-galls, see GALL-FLIES.

Nuthatch, or *Sitta Europaea*, passerine bird fairly common in the S. half of England and in Europe. Its plumage is bluish-grey above, and the under-surface is light reddish-brown or buff; the throat

is white, and the tail-feathers have white tips. The bill is powerful and wedge-shaped, and is used to force away the bark in the search for insects, as well as to break nuts. It is a skilful climber, able to descend a tree head downwards. As in other tree-climbing birds, its first toe is much developed. The nest is made commonly in a hole in a tree, and the mouth of it is plastered up with mud, except for a hole just big enough to give the bird admittance. In it are laid about seven white eggs, spotted with reddish-brown.

Nutley, tn. of Essex co., New Jersey, U.S.A. Plush, paper, cutlery, pharmaceutical preparations, hats, and leather goods are manufactured. Pop. 21,900.

Nutmeg, kernel of the fruit of several species of *Myristica*, of the family Myristicaceae, tropical trees or shrubs, natives of Asia, Madagascar, and America. The fleshy part of the fruit is rather hard, and is often eaten as a sweetmeat, resembling candied fruit; the nut is enveloped in a curious yellowish-red rind, the mace. Ns. yield a peculiar yellow fat, called oil of mace, and by distillation an almost colourless essential oil.

Nutmeg State, see CONNECTICUT.

Nutria, see under COYPU.

Nutrition, see BLOOD; CALORIE; CIRCULATION; DIET; DIGESTION; FOOD AND FEEDING.

Nuts, see under SCREWS, BOLTS, AND NUTS.

Nux Vomica, seeds of a small evergreen tree, *Strychnos Nut-vomica* (family Loganiaceae). The seeds are circular and disk-like, about the size of a halfpenny, and covered with soft fawn hairs. The tincture of the Brit. Pharmacopœia is made by treating with rectified spirit the seeds when finely powdered. The tree occurs in Indian forests as well as in the N. parts of Australia. The rind of the fruit is brittle, and the pulp white and gelatinous, and a number of seeds are produced in each fruit. They have been used to produce a brown dye. The existence in them of strychnine and brucine was not discovered until the early part of the nineteenth century; their presence accounts for the value of N. V. as a tonic.

Nyam-Nyams, see NIAM-NIAM.

Nyanja Dialects, see under NEGRO-AFRICAN LANGUAGES, Bantu.

Nyanza: 1. See ALBERT NYANZA, EDWARD NYANZA, and VICTORIA NYANZA. The two lakes formerly known as Albert Edward N. are now known as Lake Albert and Lake George. 2. Prov. of Kenya, cap. Kisumu.

Nyasa, or Nyanja, large lake in S.E. Africa, discovered by Livingstone in 1851. Its greatest length is 350 m., and its breadth from 13 to 45 m., with a total area of 14,000 sq. m. It lies 1650 ft. above sea level. The lake has abundance of fish, and is drained by the Shire into the Zambezi.